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Exercise - I (Conceptual Questions) Build Up Your Understanding

MENDELISM

1. On which plant Mendel had carried out his investigations :-
(1) Garden - pea (2) Wild pea
(3) Cow-pea (4) Pigeon pea

2. During breeding the removal of anthers from a flower is called :-
(1) Anthesis (2) Pollination
(3) Emasculation (4) Vasectomy

3. Mendel formulated the law of purity of gametes on the basis of :-
(1) Dihybrid cross (2) Monohybrid cross
(3) Back cross (4) Test cross

4. A cross between AaBB X aaBB yields a genotypic ratio of :-
(1) 1 AaBB: 1 aaBB (2) 1 AaBB : 3 aaBB
(3) 3AaBB : 1 aa BB (4) All AaBb

5. In monohybrid cross what is the ratio of homozygous dominant and homozygous recessive individuals in F_2–generation :-
(1) 1:2:1 (2) 2:1 / 1:2
(3) 3:1 / 1:3 (4) 1:1

6. The cross between recessive to it's hybrid or it's F_1 plant is called :-
(1) Back cross (2) Test cross
(3) Monohybrid cross (4) Dihybrid cross

7. What is the genotypic and phenotypic ratio of monohybrid test cross :-
(1) 1:1 (2) 1:2 (3) 3:1 (4) 1:2:1

8. Which law can be proved only by dihybrid cross?
(1) Segregation
(2) Purity of gametes
(3) Dominance
(4) Independent assortment

9. How many types & in what ratio the gametes are produced by a dihybrid heterozygous :-
(1) 4 types in the ratio of 9:3:3:1
(2) 2 types in the ratio of 3:1
(3) 3 types in the ratio of 1:2:1
(4) 4 types in the ratio of 1:1:1:1

10. How many gametes are produced in F_1 generation of a trihybrid :-
(1) 3 (2) 4 (3) 8 (4) 16

11. Which genotype represents a true dihybrid condition
(1) tt rr (2) Tt rr
(3) Tt Rr (4) TT Rr

12. Mendelian ratio 9:3:3:1 is due to :-
(1) Law of segregation
(2) Law of purity of gametes
(3) Law of independent assortment
(4) Law of unit characters

13. In a cross between a pure tall plant with green pod & a pure short plant with yellow pod. How many short plants are produced in F_2 generation out of 16 :-
(1) 1 (2) 3 (3) 4 (4) 9

14. In a dihybrid cross between AABB and aabb the ratio of AABB, AABb, aaBb, aabb in F_2 generation is :-
(1) 9:3:3:1 (2) 1:1:1:1
(3) 1:2:2:1 (4) 1:1:2:2

15. AABbCc genotype forms how many types of gametes :-
(1) 4 (2) 8 (3) 2 (4) 6

16. Who rediscovered the results of Mendel's experiments :-
(1) DeVries, Tschermak, Correns
(2) DeVries, Tschermak, Morgan
(3) Tschermak, Morgan, Correns
(4) Tschermak, Bateson, Punnet

17. Crossing AABB & aabb, the probability of AaBb would be in F_2 generation :-
(1) 1/16 (2) 2/16
(3) 8/16 (4) 4/16

18. In Mendel's experiments, colour of seed, colour of flower, position of flower, colour of pod, height of stem, are called :-
(1) Alleles (2) Genotype
(3) Phenotype (4) All of the above

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19. If 120 Plants are produced on crossing pure red and pure white flowered pea plants, then the ratio of offsprings in F_1 will be :- (Red is dominant)
(1) 90 Red : 30 White (2) 30 Red : 90 White
(3) 60 Red : 60 White (4) All Red

20. An individual with two identical members of a pair of genetic factors is called :-
(1) Hemizygous (2) Heterozygous
(3) Nonhomologous (4) Homozygous

21. Two allelic genes are located on :-
(1) The same chromosome
(2) Two homologous chromosomes
(3) Two-non-homologous chromosomes
(4) Any two chromosomes

22. The percentage of ab gametes produced by AaBb parent will be :-
(1) 12.5 (2) 25 (3) 50 (4) 75

23. How many characters of pea pod were chosen by Mendel?
(1) 7 (2) 5 (3) 4 (4) 2

24. Mendel's law of segregation is based on separation of alleles during :-
(1) Gamete formation
(2) Seed formation
(3) Pollination
(4) Embryonic development

25. When two hybrids Ttrr & Rrtt are crossed, the phenotypic ratio of offspring shall be :-
(1) 3:1 (2) 1:1:1:1
(3) 1:1 (4) 9:3:3:1

26. The allele which is unable to express its effect in the presence of another is called :-
(1) Co-dominant (2) Supplementary
(3) Complementary (4) Recessive

27. Which technique is used by Mendel for hybridisation :-
(1) Emasculation (2) Bagging
(3) Protoplast fusion (4) 1 & 2 both

28. When flowers are unisexual then emasculation is done in :-
(1) Female (2) Male
(3) 1 & 2 both (4) None of these

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29. How many plants are dihybrid in F_2 generation of dihybrid cross :-
(1) One (2) Two
(3) Four (4) Sixteen

30. When a plant has two different alleles of a gene then it is called :-
(1) Homozygous
(2) Dioecious
(3) Heterozygous
(4) Monoecious

31. Heterozygous tall plants were crossed with dwarf plants. What will be the ratio of dwarf plants in the progeny :-
(1) 50% (2) 25%
(3) 75% (4) 100%

32. A pure tall plant can be differentiated from a hybrid tall plant :-
(1) By measuring length of plant
(2) By spraying gibberellins
(3) If all plants are tall after self-pollination
(4) If all plants are dwarf after self-pollination

33. Genetic constitution of an individual is represented by :-
(1) Genome (2) Genotype
(3) Phenotype (4) Karyotype

34. Genes do not occur in pairs in :-
(1) Zygote (2) Somatic cell
(3) Embryo (4) Gametes

35. "Like begets like" an important and universal phenomenon of life, is due to :-
(1) Eugenics (2) Inheritance
(3) Dominance (4) Crossing-over

36. How many types of gametes are expected from the organism with genotype AABBCC:-
(1) One (2) Two
(3) Four (4) Eight

37. One of the following did not constitute the seven contrasting pairs of characters noticed by Mendel?
(1) Height of the plants
(2) Shape of the leaves
(3) Shape of pod
(4) Colour of pod

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38. According to Mendelism which character is showing dominance :-
(1) Terminal position of flower
(2) Green colour in seed
(3) Wrinkled seeds
(4) Green pod colour

39. Due to the cross between TTRr × ttrr the resultant progenies showed how many percent plants would be, tall, red flowered:–
(1) 50% (2) 75% (3) 25% (4) 100%

40. Mendel obtained wrinkled seeds in pea due to deposition of sugars instead of starch. It was due to which enzyme :–
(1) Amylase
(2) Invertase
(3) Diastase
(4) Absence of starch branching enzyme

41. A gene is said to be dominant if :–
(1) It express it's effect only in homozygous stage.
(2) It is expressed only in heterozygous condition
(3) It is expressed both in homozygous and heterozygous condition.
(4) It is never expressed in any condition.

42. A plant of F_1–generation with genotype "AABbCC". On selfing of this plant what is the phenotypic ratio in F_2–generation :-
(1) 3 : 1
(2) 1 : 1
(3) 9 : 3 : 3 : 1
(4) 27 : 9 : 9 : 9 : 3 : 3 : 3 : 1

43. Which one of the following traits of garden pea studied by Mendel, was a recessive feature?
(1) Axial flower position
(2) Green seed colour
(3) Green pod colour
(4) Round seed shape

44. A trihybrid cross is made between two plants with genotypes A/a B/b C/c how many offsprings of such cross will have a genotype a/a b/b c/c ?
(1) 1/64 (2) 1/4 (3) 1/16 (4) 1/32

45. How is the arrangement of seven characters selected by Mendel on four chromosomes :–
(1) One in ch. no. 1, 4 in ch. no. 4, one in ch. no. 5, and one in ch. no. 7
(2) 2 in ch. no. 1, 3 in ch. no. 4, one in ch. no. 5 and one in ch. no. 6
(3) 3 in ch. no. 1, 1 in ch. no. 4, 2 in ch. no. 5 and one in ch. no. 7
(4) 2 in ch. no. 1, 3 in ch. no. 4, 1 in ch. no. 5 and 1 in ch. no. 7

46. When two different genotypes produce the same phenotype due to environmental difference, then each one is known as :-
(1) Phenotype
(2) Phenocopy
(3) Progeny
(4) Independent offspring

47. When a red flower homozygous pea plant is crossed with a white flower plant what colour is produced in F_1 :-
(1) Red (2) White
(3) Pink (4) Red + white

48. If a heterozygous tall plant is crossed with a homozygous dwarf plant then what shall be the percentage of dwarf offsprings :-
(1) 25% (2) 100%
(3) 75% (4) 50%

49. If a homozygous tall plant is crossed with a dwarf plant, what shall be the ratio of plants in offsprings :-
(1) All heterozygous tall
(2) Two tall & Two dwarf
(3) 1:2:1
(4) All homozygous dwarf

50 How many different types of gametes can be formed by F_1 progeny, resulting from the following cross: AA BB CC x aa bb cc ?
(1) 3 (2) 8 (3) 27 (4) 64

51. Law of independent assortment of Mendel was proved by :-
(1) Monohybrid cross
(2) Reciprocal cross
(3) Dihybrid cross
(4) Back cross

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52. Mendel did not select which character in his experiment :-
(1) Plant height (2) Plant colour
(3) Pod shape (4) Pod colour

53. Genes controlling seven traits in pea studied by Mendel were actually located on:-
(1) Seven chromosomes
(2) Six chromosomes
(3) Four chromosomes
(4) Five chromosomes

54. Two crosses between the same pair of genotypes or phenotypes in which the sources of the gametes are reversed in one cross, is known as :-
(1) Test cross
(2) Reciprocal cross
(3) Dihybrid cross
(4) Reverse cross

55. If selfing occurs in the plant having genotype RrYy, then ratio of given genotype will be :- RRYY, RrYY, RRYy, RrYy
(1) 1:2:2:4 (2) 1:2:2:1
(3) 1:1:1:1 (4) 2:2:2:1

56. The process of mating between closely related individuals is :-
(1) Out-breeding (2) Inbreeding
(3) Hybridisation (4) Heterosis

57. A self–fertilizing trihybrid plant forms :-
(1) 8 different gametes and 32 zygotes
(2) 8 different gametes and 64 zygotes
(3) 4 different gametes and 16 zygotes
(4) 8 different gametes and 16 zygotes

58. Segregation of genes take place during :-
(1) Metaphase
(2) Anaphase
(3) Prophase
(4) Embryo formation

59. A trihybrid cross involves three pair of characters which will give rise to the F_1 hybrids which are heterozygous for three genes. How many types of gametes will be produced in both male and female :-
(1) 2 (2) 4 (3) 6 (4) 8

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60. When an F_1 individual is crossed with its either of the two parent. Then it is known as:-
(1) Test cross
(2) Back cross
(3) Reciprocal cross
(4) Monohybrid cross

61. If a homozygous red flowered plant is crossed with white plant, the offspring will be :-
(1) All red flowered
(2) All white flowered
(3) Half red flowered
(4) Half white flowered

62. How many types of genotypes are formed in F_2 progeny obtained from self polination of a dihybrid F_1 :-
(1) 9 (2) 3 (3) 6 (4) 1

63. If a dwarf plant is treated with gibberellins it becomes tall and this plant now crosses with pure tall plant then progeny of first generation (F_1) is :-
(1) All dwarf
(2) All tall
(3) 75% tall and 25% dwarf
(4) 75% dwarf and 25% tall

64. A test cross is performed :-
(1) by selfing of F_2-generation plants
(2) by selfing of F_1-generation plants
(3) to determine whether F_1-plant is homozgous or heterozygous
(4) between a homozygous dominant and homozygous recessive plant

65. If a cross is made between AA and aa, the nature of F_1 progeny will be :-
(1) genotypically AA, phenotypically a
(2) genotypically Aa, phenotypically a
(3) genotypically Aa, phenotypically A
(4) genotypically aa, phenotypically A

66. When a tall plant with round seeds (TTRR) is crossed with a dwarf plant with wrinkled seeds (ttrr), the F_1 generation consists of tall plants with rounded seeds. How many types of gametes F_1 plant would produce :-
(1) One (2) Three (3) Four (4) Eight

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67. A pure tall and a pure dwarf plant were crossed to produce offsprings. Offsprings were self crossed, then find out the ratio between true breeding tall to true breeding dwarf :-
(1) 1 : 1 (2) 3 : 1
(3) 2 : 1 (4) 1 : 2 : 1

68. If hybrid red flowered plants of pea are crossed back to pure red flowered parent, the progeny will show :-
(1) All red flowered plants
(2) White flowered plants
(3) 50% red and 50% white flowered plants
(4) 3 Red : 1 white flowered plants

69. What result Mendel would have got when he self pollinated a dwarf F_2 plant ?
(1) All tall plants
(2) Tall and dwarf plants in 3:1 ratio
(3) All dwarf plants
(4) Tall and dwarf plants in 1:1 ratio

70. Mendel's laws of inheritance are applicable on the plants which :-
(1) Reproduce asexually
(2) Reproduce sexually
(3) Reproduce vegetatively
(4) All of the above plants

71. Dihybrid test cross ratio proposed by Mendel is :-
(1) 9 : 3 : 3 : 1
(2) 1 : 1 : 1 : 1
(3) 1 : 2 : 2 : 4 : 1 : 2 : 1 : 2 : 1
(4) 3 : 1

72. A cross between pure tall pea plant with green pods and dwarf pea with yellow pods will produce how many tall F_2 plants, out of 16 ?
(1) 15 (2) 13 (3) 12 (4) 7

73. Mendel's Principle of segregation means that the gamete cells always receive :-
(1) one pair of alleles
(2) one quarter of the genes
(3) one of the paired alleles
(4) any pair of alleles

74. How many types of genetically different gametes will be produced by a heterozygous plant having the genotype AABbCc?
(1) Two (2) Four
(3) Six (4) Nine

75. The phenotypic ratio in a back cross between a trihybrid and homozygous recessive parent would be :-
(1) 1 : 1
(2) 1 : 1 : 1 : 1
(3) 1 : 1 : 1 : 1 : 1 : 1
(4) 1 : 1 : 1 : 1 : 1 : 1 : 1 : 1

76. Among the seven characters in pea plant, studied by Mendel, the number of characters related to flower, pod and seed respectively was:-
(1) 2, 2, 2 (2) 2, 2, 1
(3) 1, 2, 2 (4) 1, 1, 2

77. Some of the dominant traits studied by Mendel were :-
(1) Round seed shape, constricted pod shape and axial flower position
(2) Yellow seed colour, inflated pod shape and axial flower position
(3) Yellow seed colour, violet flower colour and yellow pod colour
(4) Axial flower position, green pod colour and green seed colour

78. The colour based characters in seven characters studied by Mendel in pea were:-
(1) 1 (2) 2 (3) 3 (4) 4

79. Mendel observed that all the F_1 progeny plants :-
(1) resembled either one of the parents
(2) resembled neither of the parents
(3) resembled both of the parents
(4) shows 3 : 1 ratio

80. According to Mendel, "factors" or "genes" :-
(1) are the units of inheritance
(2) contain information that is required to express a particular trait
(3) Both 1 and 2
(4) None of the above

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81. The phenotype of any character will not be affected if the modified allele produces :-
(1) Normal enzyme
(2) Non-functional enzyme
(3) No-enzyme at all
(4) 2 and 3 both

82. The recessive characters are :-
(1) Only expressed in heterozygous condition
(2) Only expressed in homozygous condition
(3) Blend in heterozygous condition
(4) Always impure

ALLELIC & NON-ALLELIC GENE INTERACTIONS

83. In Mirabilis & Antirrhinum plant the appearance of the pink hybrid (Rr) between cross of a red (RR) and white (rr) flower parent indicates :
(1) Incomplete dominance
(2) Segregation
(3) Dominance
(4) Heterosis

84. RR(red) is crossed with rr (white). All Rr offsprings are pink. This indicates that R-gene is :-
(1) Hybrid
(2) Incompletely dominant
(3) Recessive
(4) Mutant

85. In case of incomplete dominance the F_2 phenotypic ratio in monohybrid cross will be:-
(1) 1 : 2 : 1 (2) 3 : 1 : 1
(3) 9 : 3 : 3 : 1 (4) 2 : 3 : 1

86. When the phenotypic and genotypic ratios resemble in the F_2 generation it is an example of
(1) Independent assortment
(2) Qualitative inheritance
(3) Segregation of factors
(4) Incomplete dominance

87. In *Mirabilis jalapa* when homozygous red flowered and white flowered plants are crossed, all F_1 plants have pink coloured flowers. In F_2 produced by selfing of F_1 plants, red, pink, white flowered plants would appear respectively in the ratio of :-
(1) 1 : 1 : 2 (2) 2 : 1 : 1
(3) 1 : 0 : 1 (4) 1 : 2 : 1

88. In case of incomplete dominance, F_2 generation has:-
(1) Genotypic ratio equal to phenotypic ratio
(2) Genotypic ratio is 3:1
(3) Phenotypic ratio is 3:1
(4) None

89. Incomplete dominance occurs in :-
(1) Mirabilis (2) Antirrhinum
(3) Andalusian fowl (4) All of the above

90. Which cross yields red, white & pink flowers variety of dog flower :-
(1) RR X Rr (2) Rr X RR
(3) Rr X Rr (4) Rr X rr

91. Which of the following is exception to Mendel's laws?
(1) Linkage
(2) Incomplete dominance
(3) Co-dominance
(4) All of the above

92. In a dihybrid cross, when one pair of alleles show incomplete dominance, genotypic ratio comes to :-
(1) 3 : 6 : 3 : 1 : 2 : 1
(2) 1 : 2 : 2 : 4 : 1 : 2 : 1 : 2 : 1
(3) 9 : 3 : 3 : 1
(4) 1 : 2 : 1

93. Which of the following is the example of co-dominance :-
(1) $Hb^A Hb^A, I^A I^B$ (2) $Hb^s Hb^s, I^A I^B$
(3) $Hb^A Hb^s, I^A I^B$ (4) $Hb^s Hb^s, I^A I^A$

94. Which of the following conditions represent a case of co-dominant genes?
(1) A gene expresses itself, suppressing the phenotypic effect of its alleles
(2) Genes that are similar in phenotypic effect when present separately, but when together interact to produce a different trait
(3) Allele, both of which interact to produce a trait, which may resemble either of the parental type.
(4) Alleles, each of which produces an independent effect in heterozygous condition.

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95. The phenomenon of incomplete dominance was observed by :-
(1) De vries (2) Correns
(3) Tschermak (4) None

96. Mendel did not propose :-
(1) Dominance
(2) Incomplete dominance
(3) Segregation
(4) Independent assortment

97. The phenomenon in which an allele of one gene suppresses the expression of an allele of another gene is known as :-
(1) Dominance
(2) Inactivation
(3) Epistasis
(4) Suppression

98. When two independently assorting dominant genes interact with each other to produce particular phenotype but when they are present alone they do not produce that phenotype, they are called :-
(1) Complementary genes
(2) Supplementary genes
(3) Duplicate genes
(4) Inhibitory genes

99. AB - Blood group shows :-
(1) Co-dominance
(2) Complete dominance
(3) Mixed inheritance
(4) Composite inheritance

100. ABO blood group is an example of :-
(1) Epistasis
(2) Multiple allelism
(3) Pleiotropism
(4) Complementary genes

101. A child is blood group is 'O'. His parents blood group cannot be :-
(1) B and O (2) A and O
(3) AB (4) A and B

102. If one parent has blood group A and the other parent has blood group B. The offsprings have which blood group :-
(1) AB only (2) O only
(3) B only (4) A, B, AB, O

103. Ratio 9:7 is due to :-
(1) Supplementary genes
(2) Lethal genes
(3) Complementary genes
(4) Epistatic genes

104. A man of A blood group marries a woman of AB blood group. Which type of progeny would indicate that man is heterozygous A :-
(1) AB (2) A (3) O (4) B

105. A child of O blood group, has B-blood group father, the genotype of father would be :-
(1) I^0I^0 (2) I^BI^B (3) I^AI^B (4) I^BI^0

106. When a red flowered plant was cross pollinated by white flowered one and the offspring were self pollinated to obtain a phenotypic ratio of 1:2:1, it has to be a case of:
(1) Incomplete dominance
(2) Dominance
(3) Recessive epistasis
(4) Pleurotropic effect of genes

107. Dog flower exhibits :-
(1) Incomplete dominance
(2) Dominance
(3) Epistasis
(4) Co-dominance

108. A gene that shows it's effect on more than one character is :-
(1) Polygene (2) Pleotropic gene
(3) Multifactor gene (4) Multiple gene

109. In multiple allele system a gamete possesses:-
(1) Two alleles (2) Three alleles
(3) One allele (4) Several alleles

110. Blood grouping in humans is controlled by:-
(1) 4 alleles in which I^A is dominant
(2) 3 alleles in which I^A and I^B are dominant
(3) 2 alleles in which none is dominant
(4) 3 alleles in which I^A is recessive

111. Multiple alleles are present :-
(1) In different sex chromosomes
(2) At different loci on chromosome
(3) At the same locus on homologous chromosomes
(4) At the non homologous chromosomes

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112. Which of the following is true for epistasis:-
(1) In epistasis one gene pair mask/ suppress the expression of another pair of genes.
(2) Epistasis is an allelic interaction.
(3) Many genes collectively controls a particular quantitative character.
(4) In epistasis genes are always present on same chromosome.

113. Sickle cell anaemia induces due to :-
(1) Change of Amino Acid in α – chain of Haemoglobin
(2) Change of Amino Acid in β – chain of Haemoglobin
(3) Change of Amino Acid in both α and β chain of Haemoglobin
(4) Change of Amino acid either α or β chain of Haemoglobin

114. What would be the colour of flower in F_1 progeny as a result of cross between homozygous red and homozygous white flowered *Snapdragon* ?
(1) Red
(2) White
(3) Red and White
(4) Pink

115. Incomplete dominance is found in :-
(1) *Pisum sativum*
(2) *Antirrhinum majus*
(3) Both *Pisum sativum* and *Antirrhinum majus*
(4) None of these

116. In ***Mirabilis*** red (RR) and white (rr) flowered plant produces pink (Rr) flower. A plant with pink flowered plant is crossed with a plant with white flower the expected phenotypic ratio is :-
(1) red : pink : white (1 : 2: 1)
(2) pink : white (1 : 1)
(3) red : pink (1 : 1)
(4) red : white (3 : 1)

117. A child with mother of 'A' blood group and father of 'AB' blood group will be :-
(1) O (2) A
(3) A and O (4) O and B

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118. Epistasis implies :-
(1) One pair of genes can completely mask the expression of another pair of genes
(2) One pair of genes independently controls a particular phenotype
(3) One pair of genes enhances the phenotypic expression of another pair of genes
(4) Many genes collectively control a particular phenotype

119. The possible blood groups of children born to parents having A and AB groups are :-
(1) O, A (2) A, B, AB
(3) O, A, B (4) O, A, B, AB

120. A man with blood group B marries a female with blood group A and their first child is having blood group B. What is the genotype of child :-
(1) I^AI^B (2) I^AI^O (3) I^BI^O (4) I^BI^B

121. A child with mother of blood group A and father of blood group AB, will not have which of the following blood group :-
(1) A (2) B (3) AB (4) O

122. If mother has blood group B, father has A group, the offspring will be of :-
(1) A (2) O
(3) AB (4) any of the above

123. Two nonallelic genes produce the new phenotype when present together but fail to do so independently then it is called :–
(1) Epistatisis
(2) Polygene
(3) Non complementary gene
(4) Complementary gene

124. Sickle cell anemia is the result of _____ mutation in the haemoglobin gene :-
(1) frame shift (2) deletion
(3) point (4) none of the above

125. When both alleles of a pair are fully expressed in a heterozygote, they are called :-
(1) Lethals (2) Co-dominants
(3) Semi-dominants (4) Recessive allele

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126. In the inheritance of flower colour in dog flower plant, the F_1 had a phenotype that :-
(1) resembles both of the parents
(2) did not resembles either of the two parents
(3) resembles with only one parent
(4) 1 and 3 both

127. The three different alleles of human ABO blood types will produce how many genotypes & phenotypes, respectively :-
(1) 4 & 6 (2) 6 & 4
(3) 6 & 6 (4) 4 & 4

128. Other than pea plants it was found that sometimes the F_1 had a phenotype that did not resemble either of the two parents and was in between the two. It is due to :-
(1) Complete Dominance
(2) Incomplete Dominance
(3) Co-Dominance
(4) Complementary gene interaction

129. Which of the following material is good to understand incomplete dominance :-
(1) Sweet Pea
(2) Cattle
(3) Snapdragon
(4) Kernel colour in wheat

130. Find out the correct match :-
(1) F_1 resembled either of the two parents - Dominance
(2) F_1 resembled in between -Incomplete dominance
(3) F_1 resembled both parents - Co-dominance
(4) All are correct

131. Which of the following condition is true for codominance :-
(1) Phenotype of F_1 resembled either of the two parents
(2) Phenotype of F_1 did not resemble either of two parents
(3) Phenotype of F_1 resembles both parents
(4) None of these

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132. Which of the following is a good example of multiple allele :-
(1) ABO blood groups
(2) Size of starch grain in pea
(3) Shape of seed
(4) Flower colour in pea

133. In sickle cell anaemia :-
(1) The mutant haemoglobin molecule undergoes polymerisation under low oxygen tension causing the change in the shape of RBC
(2) Substitution of Glutamic acid by valine at the sixth position of the α-chain of haemoglobin
(3) The mutant haemoglobin undergoes polymerization under high oxygen tension causing the change in shape of RBC
(4) α-globin chain is modified

134. In a cross between true breeding red flowered (RR) and true breeding white flowered (rr), snapdragon plant, the F_1(Rr) was pink. When the F_1 was self pollinated the F_2 resulted in the following ratio 1(RR) red; 2(Rr) pink; 1(rr) white. Above condition can be explained by :-
(1) True dominance
(2) Incomplete dominance
(3) Lethal gene
(4) Independent assortment

135. In case of ABO blood group allele I^A and I^B if present together then :-
(1) Only I^A allele expresses
(2) Only I^B allele expresses
(3) Both I^A and I^B alleles express
(4) None of these

POLYGENIC AND CYTOPLASMIC INHERITANCE

136. An example of polygenic inheritance in human beings is :-
(1) skin colour
(2) sickle cell anaemia
(3) colour blindness
(4) phenylketonuria

137. Which one carries extra nuclear genetic material ?
(1) Plastids (2) Ribosomes
(3) Chromosomes (4) Golgi-complex

138. When certain character is inherited only through the female parent, it probably represents the case of :-
(1) Mendelian nuclear inheritance
(2) Multiple gene inheritance
(3) Cytoplasmic inheritance
(4) Incomplete dominance

139. Cytoplasmic male sterility is inherited :-
(1) Maternally
(2) Paternally
(3) Both
(4) Bacteriophage multiplication

140. In which type of inheritance the results are affected by reciprocal cross :-
(1) Nuclear (autosomal gene)
(2) Cytoplasmic
(3) Blending
(4) All the above

141. The scientist who first discovered cytoplasmic - inheritance was :-
(1) Correns (2) Rhoades
(3) Mendel (4) Morgan

142. Extranuclear inheritance is a consequence of presence of genes in :-
(1) Lysosomes and ribosomes
(2) Mitochondria and chloroplasts
(3) Endoplasmic reticulum and mitochondria
(4) Ribosomes and chloroplasts

143. Inheritance of skin colour in human beings is an example of :-
(1) Complementary gene
(2) Monogenic inheritance
(3) Polygenic inheritance
(4) Mendelian inheritance

144. Polygenic genes show :-
(1) Identical phenotypes
(2) Identical biochemistry
(3) Different phenotypes
(4) Identical genotypes

145. A dihybrid ratio of 1:4:6:4:1 is obtained instead of 9:3:3:1. This is an example of :-
(1) Complementary gene
(2) Supplementary gene
(3) Polygenic inheritance
(4) Incomplete dominance

TG: @Chalnaayaaar

146. In polygenic inheritance a trait is controlled by three polygenes. Two individuals which are heterozygous for three alleles, crossed with each other. Such type of cross produces what phenotypic ratio :-
(1) 1 : 2 : 1
(2) 9 : 3 : 3 : 1
(3) 1 : 4 : 6 : 4 : 1
(4) 1 : 6 : 15 : 20 : 15 : 6 : 1

147. In tomato, genotype aabbcc produces 100g tomatoes and AABBCC produces 160g tomatoes. What is contribution of each dominant allele in the production of tomatoes:-
(1) 10 g (2) 20 g
(3) 30 g (4) 40 g

148. A polygenic trait is controlled by 3 polygenes A, B and C. In a cross AaBbCc × AaBbCc, the phenotypic ratio of the offsprings was observed as :-
1 : 6 : × : 20 : × : 6 : 1
what is the possible value of x ?
(1) 3 (2) 9
(3) 15 (4) 25

149. Gene for cytoplasmic male sterility in plants are generally located in the :-
(1) chloroplast genome
(2) mitochondrial genome
(3) nuclear genome
(4) cytosol

LINKAGE, SEX LINKAGE

150. What is the inheritance of colour blindness if both parents having a normal vision but mother has a recessive gene for colour blindness :-

	Son	Daughter
(1)	50%	Nil
(2)	100%	Nil
(3)	Nil	100%
(4)	Nil	Nil

TG: @Chalnaayaaar

151. What would be the nature of children if a colour blind woman marries a normal man:-
(1) Colourblind daughter & normal sons
(2) Colourblind sons and carrier daughters
(3) Normal sons & carrier daughters
(4) Normal sons & Normal daughters

152. A colourblind man marries a normal lady whose father was colour blind. If they produce two sons & two daughters, how many of them would suffer?
(1) Both sons
(2) Both daughters
(3) One son & one daughter
(4) Both sons & both daughters

153. A colourblind daughter is born when :-
(1) Father is colourblind, mother is homozygous normal
(2) Mother is colourblind, father is normal
(3) Mother is carrier, father is normal
(4) Mother is carrier, father is colourblind

154. Hypertrichosis is :-
(1) Holandric character
(2) X-Linked character
(3) Diagenic character
(4) Sex-influenced character

155. In which of the following the inheritance takes place only by male :-
(1) Nuclear
(2) Cytoplasmic
(3) Co-dominance
(4) Holandric inheritance

156. Which of the following is not a sex linked characters ?
(1) Haemophilia (2) Colour blindness
(3) Hypertrichosis (4) Baldness

157. A gene located on Y-chromosome and transmitted from father to son is known as:-
(1) Supplementary gene
(2) Complementary gene
(3) Duplicate gene
(4) Holandric gene

158. The condition in which only one allele of a pair is present in a diploid organism is known as :-
(1) Homozygous
(2) Heterozygous
(3) Hemizygous
(4) Incomplete dominance

159. Pattern baldness in man is a :-
(1) Autosomal character
(2) Sex linked character
(3) Sex influenced character
(4) 1 and 3 both

160. A colourblind man marries a daughter of colourblind father, then in the offsprings :-
(1) All sons are colourblind
(2) All daughters are colourblind
(3) Half sons are colourblind
(4) No daughter is colourblind

161. A woman with normal vision marries a man with normal vision and gives birth to a colourblind son. Her husband dies and she marries a colourblind man. what is the probability of her children having the abnormality :-
(1) 50% colourblind sons + 50% colourblind daughters
(2) All sons colourblind & daughters carrier
(3) All daughters colourblind & sons normal
(4) 50% sons colourblind and all daughters normal

162. A single recessive gene which can express its effect, should occur on :-
(1) Any autosome
(2) Any-chromosome
(3) X-chromosome of female
(4) X-chromosome of male

163. Sex-linked disorders are generally :-
(1) Lethal
(2) Recessive
(3) Dominant
(4) Not inherited

TG: @Chalnaayaaar

164. In *Drosophila* crossing over occurs in female but not in male. Gene A and B are 10 map unit apart on chromosome. A female *Drosophila* with genotype $\frac{AB}{ab}$ and male *Drosophila* with genotype $\frac{AB}{ab}$. How many types of gametes are produced by female and male *Drosophila* respectively :-
(1) 4 types : 2 types
(2) 2 types : 2 types
(3) 4 types : 4 types
(4) 4 types : one types

165. In a cross between individuals homozygous for (a, b) and wild type (+ +). In this cross 700 out of 1000 individuals were of parental type. Then the distance between a and b is :-
(1) 70 map unit
(2) 35 map unit
(3) 30 map unit
(4) 15 map unit

166. In maize coloured endosperm (C) is dominant over colourless (c) and full endosperm (R) is dominant over shrunken (r). When a dihybrid of F_1-generation was test crossed it produced four phenotypes in the following percentage
Coloured and Full = 45%
Coloured – Shrunken = 5%
Colourless – Full = 4%
Colourless – Shrunken = 46%
From these data what would be distance between the two non allelic genes :-
(1) 48 unit (2) 9 unit
(3) 4 unit (4) 12 unit

167. What ratio is expected in offsprings if father is colour blind and mother's father was colour blind :-
(1) 50% daughters - colour blind
(2) All the sons - colour blind
(3) All the daughters - colour blind
(4) All the sons - normal

TG: @Chalnaayaaar

168. There are three genes a, b, c percentage of crossing over between a and b is 20%, b and c is 28% and a and c is 8%. What is the sequence of genes on chromosome :-
(1) b, a, c (2) a, b, c
(3) a, c, b (4) None

169. The linkage map of X-chromosome of fruitfly has 66 map units, with yellow body gene (y) at one end and bobbed hair (b) gene at the other end. The recombination frequency between these two genes (y and b) should be:-
(1) 60% (2) > 50%
(3) ≤ 50% (4) 100%

170. Mammary glands in female, moustaches and beard in human males are examples of :-
(1) Sex linked traits
(2) Sex limited traits
(3) Sex differentiating traits
(4) Sex-determining traits

171. When a cluster of genes show linkage behaviour they :-
(1) Do not show a chromosome map
(2) Show recombination during meiosis
(3) Do not show independent assortment
(4) Induce cell division

172. Genetic Map is one that :-
(1) Establishes sites of the genes on a chromosome
(2) Establishes the various stages in gene evolution
(3) Shows the stages during the cell division
(4) Shows the distribution of various species in a region

173. One of the genes present exclusively on the X–chromosome in humans is concerned with:
(1) Baldness
(2) Red green colour blindness.
(3) Facial hair/Moustaches in males.
(4) Sickle cell anemia

174. The recessive genes located on X–chromosome in humans are always :-
(1) Expressed in females
(2) Lethal
(3) Sub–lethal
(4) Expressed in males

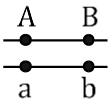
TG: @Chalnaayaaar

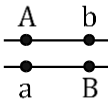
175. Lack of independent assortment of two genes A and B in fruitfly is due to :-
(1) Crossing over (2) Repulsion
(3) Recombination (4) Linkage

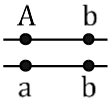
176. A normal woman, whose father was colour–blind is married to a normal man. The sons would be :-
(1) All colour–blind
(2) 75% colour–blind
(3) 50% colour–blind
(4) All normal

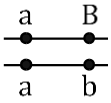
177. If father shows normal genotype and mother shows a carrier trait for haemophilia then :-
(1) All the female children will be carrier
(2) A male child has 50% chances of active disease
(3) Female child has probability of 50% to active disease
(4) All the female children will be colourblind

178. Which of the following show linkage group in coupling phase :-

(1) 

(2) 

(3) 

(4) 

179. The longer the chromosome of an organism, the more genetic variability it gets from :-
(1) Independent assortment
(2) Linkage
(3) Crossing over
(4) Mutation

180. A woman with normal vision, but whose father was colour blind, marries a colour blind man. Suppose that the fourth child of this couple was a boy. This boy :-
(1) Must have normal colour vision
(2) May be colour blind or may be normal vision
(3) Will be partially colour blind since he is hemizygous for the colour blind mutant allele
(4) Must be colour blind

TG: @Chalnaayaaar

181. Haemophilia is more commonly seen in human males than in human females because:-
(1) This disease is due to a Y–linked recessive mutation
(2) This disease is due to an X–linked recessive mutation
(3) This disease is due to an X–linked dominant gene
(4) A greater proportion of girls die in infancy

182. If Mendel has chosen to study traits determined by linked genes he would not have discovered :-
(1) Law of segregation
(2) Law of dominance
(3) Law of independent assortment
(4) Law of unit character

183. Which law would have been violated if Mendel had chosen eight characters in garden-pea :-
(1) Law of dominance
(2) Law of segregation
(3) Law of independent assortment
(4) Law of purity of gametes

184. If Mendel might have studies 7 pairs of characters in a plant with 12 chromosomes, instead of 14, then :-
(1) He could not discover independent assortment
(2) He might have not discovered linkage
(3) He might have discovered crossing-over
(4) He might have not observed dominance

185. With increasing age the linkage becomes :-
(1) Strong
(2) Weak
(3) Terminates
(4) Remains unchanged

186. If there were only parental combinations in F_2 of a dihybrid cross then Mendel might have discovered :-
(1) Independent assortment
(2) Atavism
(3) Linkage
(4) Repulsion

187. Linkage was discovered in *Drosophila* by :-
(1) Bateson (2) Morgan
(3) Muller (4) Correns

188. A dihybrid plant with incomplete linkage on test cross may produce how many types of plants:-
(1) 2 (2) 4 (3) 8 (4) 1

189. How many linkage group are there in bacteria *E.coli* ?
(1) One (2) Two
(3) Four (4) None

190. If distance between gene on chromosome is more, then gene shows :-
(1) Weak linkage (2) Strong linkage
(3) Less crossing (4) 1 & 3 both

191. Linked gene shows :-
(1) Always non-parental combinations
(2) Sometimes new combinations
(3) Always new combinations
(4) New combinations more

192. The number of linkage groups in a cell having 10 pairs of chromosomes are :-
(1) 5 (2) 10
(3) 15 (4) 20

193. The association of parental characters combinations in the offsprings of a dihybrid is excess to non-parental combinations is said to be due to :-
(1) Co-dominance
(2) Blending inheritance
(3) Linkage
(4) Duplicate genes

194. Complete linkage is found in :-
(1) Birds
(2) Snakes
(3) Female - *Drosophila*
(4) Male - *Drosophila*

195. A phenomenon which works opposite to the linkage is :-
(1) Independent assortment
(2) Crossing-over
(3) Segregation
(4) Mutation

TG: @Chalnaayaaar

196. Cross over value (COV) of gene A and B is 5% while COV of genes B and C is 15% the possible sequence of these genes on chromosome is :-
(1) A-B-C (2) C-A-B
(3) B-C-A (4) Both (1) & (2)

197. TDF gene is a :-
(1) A gene present on X–chromosome
(2) A segment of RNA
(3) A proteinaceous factor
(4) A gene present on Y–chromosome

198. A diseased man marries a normal woman. They get three daughters and five sons. All the daughters were diseased and sons were normal. The gene of this disease is :–
(1) Sex linked dominant
(2) Sex linked recessive
(3) Sex limited character
(4) Autosomal dominant

199. Who postulated the 'Chromosomal theory of Inheritance' ?
(1) De Vries (2) Mendel
(3) Sutton and Boveri (4) Morgan

200. ***Drosophila melanogaster*** has :-
(1) 2 pairs of autosomes and 1 pair of sex chromosomes
(2) 3 pairs of autosomes and 3 pairs of sex chromosomes
(3) 1 pairs of autosomes and 3 pairs of sex chromosomes
(4) 3 pairs of autosomes and 1 pairs of sex chromosomes

201. Walter Sutton is famous for his contribution to:
(1) Genetic engineering
(2) Totipotency
(3) Quantitative genetics
(4) Chromosomal theory of inheritance

202. If a colour blind man marries a girl who is normal (homozygous) for this character, then genotypically :-
(1) sons and daughters will be normal
(2) sons will be colour blind, daughters will be normal
(3) sons will be normal, daughters will be carriers
(4) both sons and daughters will be colour blind

TG: @Chalnaayaaar

203. Frequency of crossing over will be relatively more if :-
(1) distance between the two genes is less
(2) distance between the two genes is more
(3) linked genes are more
(4) both (2) & (3)

204. Presence of recombinants is due to :-
(1) crossing over
(2) linkage
(3) lack of independent assortment
(4) all of the above

205. Morgan coined the term____ to describe the physical association of genes on a chromosome & the term__to describe the generation of non-parental gene combinations :-
(1) Recombination; Linkage
(2) Recombination; Non-recombination
(3) Linkage; Non-recombination
(4) Linkage; Recombination

206. Experimental verification of the chromosomal theory of inheritance done by Thomas Hunt Morgan and his colleagues they worked with :-
(1) Pea plant (2) Sweet pea plant
(3) Snapdragon (4) *Drosophila*

207. Which is incorrect for *Drosophila melanogaster ?*
(1) They could be grown on simple synthetic medium
(2) Single mating could produces a large number of progeny
(3) They complete their life cycle in about 7 weeks
(4) There was a clear differentiation of the sexes.

208. Morgan and his group found that when genes were grouped on the same chromosome, some genes were very tightly linked and showed :-
(1) Very low recombination
(2) Higher recombination
(3) No recombination
(4) 100% parental combination

209. Which statement is not true for ***Drosophila melanogaster*** :-
(1) They complete their life cycle about two weeks
(2) Single mating produce large number of progeny flies
(3) It has few hereditary variation that can be seen with high power microscope
(4) It has clear differentiation of the sex

210. The experimental verification of the chromosomal theory of inheritance was done by :-
(1) Boveri (2) Sutton
(3) T.H. Morgan (4) Bateson

SEX DETERMINATION

211. How the sex of offsprings determined in humans :-
(1) Sex chromosome of mother
(2) Size of ovum
(3) Size of sperm
(4) Sex chromosome of father

212. Which of the following possess homogametic male :-
(1) Plants (2) Man (3) Insect (4) Birds

213. Which chromosome set is found in male grasshopper :-
(1) 2A + XY (2) 2A + XO
(3) 2A + YY (4) 2A + XX

214. Genic balance theory for sex determination in *Drosophila* was proposed by :-
(1) Pro. R. P. Roy (2) H. E. Warmke
(3) C. B. Bridges (4) Mc. clung

215. No. of Bar Body in XXXX female :-
(1) 1 (2) 2 (3) 3 (4) 4

216. According to C.B. Bridges in *Drosophila*, the sex is determined by :-
(1) The ratio of number of X–chromosomes to the sets of autosomes
(2) X and Y chromosomes
(3) The ratio of pairs of X-chromosomes to the pairs of autosomes
(4) Whether the egg is fertilized or develops parthenogenetically

TG: @Chalnaayaaar

217. According to genic balance theory In *Drosophila* male differentiation is controlled by :-
(1) No. of Y–chromosome
(2) No. of X–chromosomes
(3) Ratio between number of X–chromosome and the set of autosome
(4) Sets of autosomes

218. Sex index ratio in an organism is given $\frac{X}{A}=1.5$, then organism will be :-
(1) male (2) female
(3) super female (4) intersex

219. Barr body is associated with :-
(1) sex chromosome of female
(2) sex chromosome of male
(3) autosome of female
(4) autosome of male

220. In male grass hoppers and moths there are two pairs of autosomes and :-
(1) X only (2) X and Y
(3) Y only (4) none of these

221. Which of the following symbols are used for representing sex chromosome of birds:-
(1) ZZ – ZW (2) XX – XY
(3) XO – XX (4) ZZ – WW

222. If somatic cells of a human male contain single Barrbody, the genetic composition of the person would be :-
(1) XYY (2) XXY
(3) XO (4) XXXY

223. Sex determination in humans takes place by:-
(1) sex chromosomes of father
(2) measurement of sperm
(3) measurement of ovum
(4) sex chromosomes of mother

224. In *Drosophila* sex index ratio of super female is :-
(1) 1 (2) 0.5 (3) 1.5 (4) 0.67

225. If X/A Ratio of two *Drosophila* is 0.6 and 0.33 respectively what would be their sex :-
(1) Female & male
(2) Super female & super male
(3) Inter sex & super male
(4) Inter sex and super female

TG: @Chalnaayaaar

226. Which of the following genotype represents intersex *Drosophila* :-
(1) 2A + XXX (2) 2A + XXY
(3) 3A + XXY (4) 2A + XY

227. In which organism female is homogametic & also has one chromosome more than male?
(1) Birds (2) Drosophila
(3) Chicks (4) Grasshopper

228. Grasshopper is an example of :-
(1) XO type of sex determination
(2) XY type of sex determination
(3) Environmental sex determination
(4) Genic balance theory

229. Which of the following is responsible for sex determination in chicks fowls:-
(1) Sperm (2) Egg
(3) Somatic cell (4) Every cell of body

230. In which of the following sex is determined by female individual :-
(1) Human (2) Drosophila
(3) Birds (4) Grasshopper

231. Male heterogamy found in case of :-
(1) XO type male in Grasshopper
(2) XY type male in human
(3) ZW male in birds
(4) 1 and 2 both

HUMAN GENETICS, POPULATION GENETICS

232. There are two alleles (A_1 & A_2) out of which one (A_1) has nil abundance in a population then the abundance of second allele (A_2) is :-
(1) 0.25 (2) 1.00
(3) 0.40 (4) 0.50

233. If a normal woman marries an albino man and their offsprings are half albino, half normal the woman is :-
(1) Homozygous normal
(2) Heterozygous normal
(3) Homozygous recessive
(4) Homozygous dominant

234. Which is a dominant trait :-
(1) Colour blindness (2) Albinism
(3) Haemophilia (4) Rh factor

TG: @Chalnaayaaar

235. Parents are carrier for albinism. What will be the first three children :-
(1) Some normal, heterozygous & albino
(2) All normal
(3) All heterozygous albino
(4) No normal

236. If a cross is made between two individuals each having genotype Bb, two offsprings are obtained. Out of these first has dominant trait. What is the probability that the second offspring will exhibit recessive trait ?
(1) 1/4 (2) 100
(3) Zero (4) 3/4

237. A family has five girls and no son, the probability of the occurrence of son as 6^{th} child is :-
(1) 1/2 (2) 1/5
(3) 1 (4) No chance

238. A tobacco plant heterozygous for albinism is self-pollinated and 1200 seeds are subsequently germinated. How many seedlings would have the parental genotype:-
(1) 900 (2) 600
(3) 1200 (4) 300

239. The migration of gene in to a population from other population by interbreeding is called :-
(1) Gene pool (2) Gene flow
(3) Genetic drift (4) Gene erosion

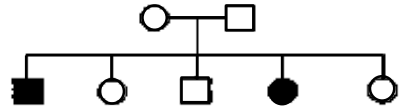
240. What is the probability of three daughters to a couple in three children :-
(1) $\frac{1}{4}$ (2) $\frac{1}{8}$ (3) $\frac{1}{16}$ (4) $\frac{3}{8}$

241. In human right handedness is dominant over left handedness. What offsprings would be expected from two left handed parents :-
(1) Only left handed
(2) Only right handed
(3) Left handed & right handed both
(4) Neither left handed nor right handed

242. Probability of four sons to a couple is :–
(1) $\frac{1}{4}$ (2) $\frac{1}{8}$ (3) $\frac{1}{16}$ (4) $\frac{1}{32}$

243. A male human is heterozygous for autosomal genes A and B and is also hemizygous for hemophilic gene h. What proportion of his sperms will be abh :-
(1) $\frac{1}{4}$ (2) $\frac{1}{8}$
(3) $\frac{1}{32}$ (4) $\frac{1}{16}$

244 Given below is a pedigree chart of a family with five children. It shows the inheritance of attached ear–lobes as opposed to the free ones. The squares represent the male individuals and circles the female individuals



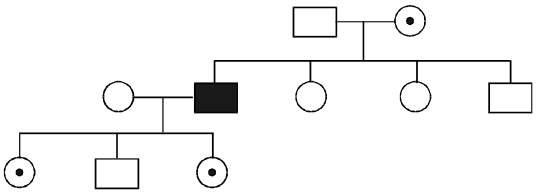
Which one of the following conclusions drawn is correct :–
(1) The parents are homozygous recessive
(2) The trait is Y–linked
(3) The parents are homozygous dominant
(4) The parents are heterozygous

245. Equilibrium of gene frequencies is :-
(1) $P^2 \times 2Pq \times q^2 = 1$
(2) $\sigma = \sqrt{\frac{Pq}{N}}$
(3) Hardy Weinberg law
(4) Mutation

246. In a random mating population of 28,800 individuals, percentage of dominant homozygous individuals is 49% find out the percentage of heterozygous individuals :-
(1) 21% (2) 42%
(3) 32% (4) 9%

TG: @Chalnaayaaar

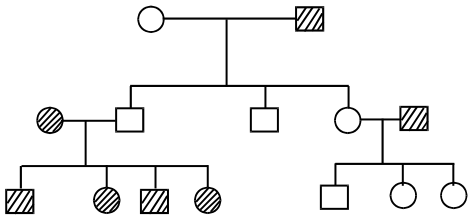
247. Predict from the following chart :-



(1) Character is dominant and carried by X chromosome
(2) Character is carried by Y chromosome
(3) Character is sex linked recessive
(4) Character is autosomal recessive

248. In pedigree analysis symbol ⊙ is used for :-
(1) Heterozygous for autosomal recessive
(2) Affected individuals
(3) Death
(4) Carrier for sex linked recessive

249. Study the given pedigree carefully, the trait indicated is :-

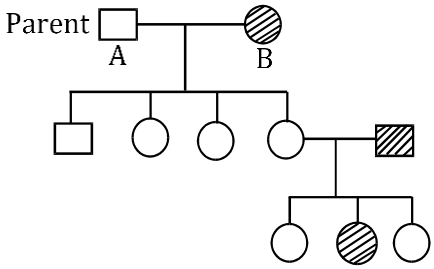


□ : Normal male
▨ : Affected male
○ : Normal female
◍ : Affected female
(1) Autosomal recessive
(2) X–linked recessive
(3) Maternal inheritance
(4) Paternal inheritance

250. In a population that is in Hardy Weinberg equilibrium, the frequency of a recessive allele for a certain hereditary trait is 0.20. What percentage of the individual in the next generation would be expected to show the dominant trait :-
(1) 16% (2) 32%
(3) 64% (4) 96%

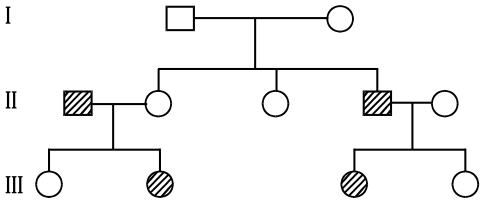
TG: @Chalnaayaaar

251. Given pedigree shows inheritance of autosomal recessive gene. What is the genotype of given parents :-



(1) AA, aa (2) aa, AA
(3) aa, Aa (4) Aa, Aa

252. A pedigree is shown below for a disease that is autosomal recessive. The genetic make up of the first generation :-



(1) AA, aa (2) Aa, Aa
(3) Aa, aa (4) aa, aa

253. In a random mating population frequency of disease causing recessive allele is 80%. What would be the frequency of carrier individuals in population :-
(1) 64% (2) 32% (3) 16% (4) 100%

254. In a random mating population frequency of dominant allele is 0.7. What will be the frequency of recessive phenotype :–
(1) 0.49 (2) 0.09 (3) 0.3 (4) 0.21

255. At a particular locus, frequency of 'A' allele is 0·6 and that of 'a' is 0·4. What would be the frequency of heterozygotes in a random mating population at equilibrium :-
(1) 0·24 (2) 0·16 (3) 0·48 (4) 0·36

256. A normal woman whose father was albino, marries an albino man, what proportion of normal and albino are expected among their offsprings :-
(1) All normal (2) 2 normal : 1 Albino
(3) All albino (4) 1 normal : 1 Albino

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257. Albinism is determined by a recessive gene in man. The presence of albinism in 50% children born to a couple proves that :-
(1) Both parents are heterozygous for albinism
(2) Father is homozygous normal and mother is heterozygous
(3) Father is homozygous for albinism but mother is heterozygous
(4) Both are homozygous

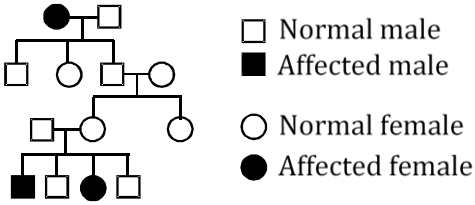
258. Family has 9 girls, Probability of son at 10th birth is :-
(1) 50% (2) 100% (3) 25% (4) 75%

259. Polydactyly in man is due to :-
(1) autosomal dominant gene
(2) autosomal recessive gene
(3) sex - linked dominant gene
(4) sex - linked recessive gene

260. Blue eye colour in human is recessive to brown eye colour. The expected children of a marriage between a blue eyed woman and a brown eyed man who had a blue eyed mother will be :-
(1) All black eyed
(2) All blue eyed
(3) All brown eyed
(4) One blue eyed and one brown eyed

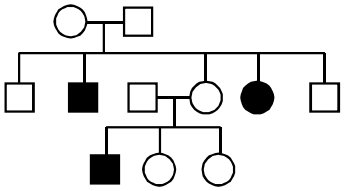
261. The existence within a population of non-beneficial alleles in heterozygous genotype is:-
(1) genetic load (2) genetic drift
(3) genetic flow (4) selection

262. Study the pedigree given below and assign the type of inheritance of the trait :-

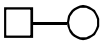
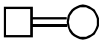
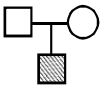


(1) X-linked recessive
(2) Y-linked
(3) autosomal recessive
(4) autosomal dominant

263. Given below is the pedigree of sickle cell anaemia, in a family :-



In this the RBC of both parents will be –
(1) Normal
(2) Sickle shaped
(3) Both normal & sickle shaped
(4) Cannot be determined

264. Which of the following symbol is used for mating between relatives (Consanguineous mating)?
(1)
(2) 
(3) 
(4) 

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EXERCISE-I (Conceptual Questions) ANSWER KEY

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer	1	3	2	1	4	2	1	4	4	3	3	3	3	3	1
Question	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Answer	1	4	3	4	4	2	2	4	1	2	4	4	4	3	3
Question	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Answer	1	3	2	4	2	1	2	4	1	4	3	1	2	1	4
Question	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Answer	2	1	4	1	2	3	2	3	2	1	2	2	2	4	2
Question	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
Answer	1	1	2	3	3	3	1	1	3	2	2	3	3	2	4
Question	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
Answer	1	2	3	1	3	1	2	1	2	1	4	4	1	4	3
Question	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105
Answer	4	2	3	4	2	2	3	1	1	2	3	4	3	4	4
Question	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
Answer	1	1	2	3	2	3	1	2	4	3	2	2	1	2	3
Question	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135
Answer	4	4	4	3	2	2	2	2	3	4	3	1	1	2	3
Question	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150
Answer	1	1	3	1	2	1	2	3	3	3	4	1	3	2	1
Question	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165
Answer	2	3	4	1	4	4	4	3	4	3	1	4	2	1	3
Question	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
Answer	2	1	1	3	2	3	1	2	4	4	3	2	1	3	2
Question	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195
Answer	2	3	3	1	1	3	2	2	1	1	2	2	3	4	2
Question	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210
Answer	4	4	1	3	4	4	3	2	1	4	4	3	1	3	3
Question	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225
Answer	4	4	2	3	3	1	3	3	1	1	1	2	1	3	3
Question	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240
Answer	3	4	1	2	3	4	2	2	4	1	1	1	2	2	2
Question	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255
Answer	1	3	2	4	3	2	3	4	3	4	1	2	2	2	3
Question	256	257	258	259	260	261	262	263	264						
Answer	4	3	1	1	4	1	3	3	3						

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Exercise - II (Previous Year Questions) AIPMT/NEET

AIPMT 2006

1. Phenotype of an organism is the result of :-
(1) Mutations and linkages
(2) Cytoplasmic effects and nutrition
(3) Environmental changes and sexual dimorphism
(4) Genotype and environment interactions

2. How many different kinds of gametes will be produced by a plant having the genotype AABbCC?
(1) Three (2) Four
(3) Nine (4) Two

3. Test cross involves :-
(1) Crossing between two genotypes with recessive trait
(2) Crossing between two F_1 hybrids
(3) Crossing the F_1 hybrid with a double recessive genotype
(4) Crossing between two genotypes with dominant trait

4. In Mendel's experiments with garden pea, round seed shape (RR) was dominant over wrinkled seeds (rr), yellow cotyledon (YY) was dominant over green cotyledon (yy). What are the expected phenotypes in the F_2 generation of the cross RRYY × rryy ?
(1) Only round seeds with green cotyledons
(2) Only wrinkled seeds with yellow cotyledons
(3) Only wrinkled seeds with green cotyledons
(4) Round seeds with yellow cotyledons, and wrinkled seeds with yellow cotyledons

5. Which one of the following is the most suitable medium for culture of *Drosophila melanogaster* ?
(1) Moist bread
(2) Agar-agar
(3) Ripe banana
(4) Cow dung

6. If a colourblind woman marries a normal visioned man, their sons will be :-
(1) All normal visioned
(2) One–half colourblind & one–half normal
(3) Three–fourths colourblind & one– fourth normal
(4) All colourblind

7. In which mode of inheritance do you expect more maternal influence among the offspring?
(1) Autosomal (2) Cytoplasmic
(3) Y-linked (4) X-linked

AIPMT 2007

8. A human male produces sperms with the genotypes AB, Ab, aB, and ab, in equal proportions. What is the corresponding genotype of this person :-
(1) AaBb (2) AaBB
(3) AABb (4) AABB

9. In pea plants, yellow seeds are dominant to green. If a heterozygous yellow seeded plant is crossed with a green seeded plant, what ratio of yellow and green seeded plants would you expect in F_1 generation :-
(1) 50 : 50 (2) 9 : 1
(3) 1 : 3 (4) 3 : 1

10. Inheritance of skin colour in humans is an example of :-
(1) chromosomal aberration
(2) point mutation
(3) polygenic inheritance
(4) codominance

11. Two genes R and Y are located very close on the chromosomal linkage map of maize plant. When RRYY and rryy genotypes are hybridized, the F_2 segregation will show :-
(1) Higher number of the recombinant types.
(2) Segregation in the expected 9:3:3:1 ratio.
(3) Segregation in 3:1 ratio.
(4) Higher number of the parental types

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AIPMT 2008

12. Which one of the following conditions in humans is ***correctly*** matched with its chromosomal abnormality/linkage ?
(1) Erythroblastosis fetalis –X linked
(2) Down syndrome – 44 autosomes + XO
(3) Klinefelter's syndrome –44 autosomes +XXY
(4) Colour blindness – Y linked

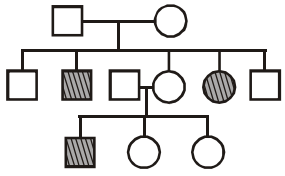
AIPMT 2009

13. Sickle cell anemia is :-
(1) Characterized by elongated sickle like RBCs with a nucleus
(2) An autosomal linked dominant trait
(3) Caused by substitution of valine by glutamic acid in the beta globin chain of haemoglobin
(4) Caused by a change in a single base pair of DNA

14. The most popularly known blood grouping is the ABO grouping. It is named ABO and not ABC, because "O" in it refers to having:-
(1) No antigens A and B on RBCs
(2) Other antigens besides A and B on RBCs
(3) Overdominance of this type on the genes for A and B types
(4) One antibody only - either anti–A or anti–B on the RBCs

15. Select the incorrect statement from the following:-
(1) Baldness is a sex-limited trait
(2) Linkage is an exception to the principle of independent assortment in heredity
(3) Galactosemia is an inborn error of metabolism
(4) Small population size results in random genetic drift in a population

16. Study the pedigree chart given below :-



What does it show :-
(1) Inheritance of a recessive sex-linked disease like haemophilia
(2) Inheritance of a sex-linked inborn error of metabolism like phenylketonuria
(3) Inheritance of a condition like phenylketonuria as an autosomal recessive trait
(4) The pedigree chart is wrong as this is not possible

AIPMT 2010

17. The genotype of a plant showing the dominant phenotype can be determined by :-
(1) Pedigree analysis
(2) Back cross
(3) Test cross
(4) Dihybrid cross

18. Which one of the following cannot be explained on the basis of Mendel's Law of Dominance?
(1) Alleles do not show any blending and both the characters recover as such in F_2 generation
(2) Factors occur in pairs
(3) The discrete unit controlling a particular character is called a factor
(4) Out of one pair of factors one is dominant and the other recessive

19. ABO blood groups in humans are controlled by the gene I. It has three alleles - I^A, I^B and i. Since there are three different alleles, six different genotypes are possible. How many phenotypes can occur?
(1) Four (2) Two (3) Three (4) One

20. Select the correct statement from the ones gives below with respect to dihybrid cross :
(1) Genes loosely linked on the same chromosome show similar recombination as the tightly linked ones
(2) Tightly linked genes on the same chromosome show very few recombination's
(3) Tightly linked genes on the same chromosome show higher recombination
(4) Genes far apart on the same chromosome show very few recombination's

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21. Which one of the following symbols and its representation, used in human pedigree analysis is correct?
(1) □ = unaffected female
(2) ◆ = male affected
(3) □═○ = mating between relatives
(4) ○ = unaffected male

AIPMT (Pre.) 2011

22. When two unrelated individuals or lines are crossed, the performance of F_1 hybrid is often superior to both its parents. This phenomenon is called :-
(1) Heterosis (2) Transformation
(3) Splicing (4) Metamorphosis

23. Which one of the following conditions correctly describes the manner of determining the sex in the given example ?
(1) Homozygous sex chromosomes (ZZ) determine female sex in Birds.
(2) XO type of sex chromosomes determine male sex in grasshopper
(3) XO condition in humans as found in Turner Syndrome, determines female sex.
(4) Homozygous sex chromosomes (XX) produce male in *Drosophila*

AIPMT (Mains) 2011

24. Test cross in plants or in *Drosophila* involves crossing :-
(1) Between two genotypes with dominant trait
(2) Between two genotypes with recessive trait
(3) Between two F_1 hybrids
(4) The F_1 hybrid with a double recessive genotype

25. Which one of the following conditions of the zygotic cell would lead to the birth of a normal human female child ?
(1) One X and one Y chromosome
(2) Two X chromosomes
(3) Only one Y chromosome
(4) Only one X chromosome

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AIPMT (Pre.) 2012

26. F_2 generation in a Mendelian cross showed that both genotypic and phenotypic ratios are same as 1 : 2 : 1. It represents a case of:-
(1) Monohybrid cross with complete dominance
(2) Monohybrid cross with incomplete dominance
(3) Co-dominance
(4) Dihybrid cross

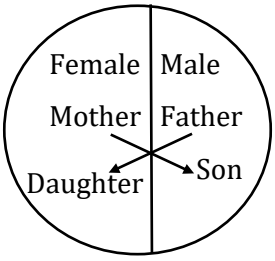
27. A certain road accident patient with unknown blood group needs immediate blood transfusion. His one doctor friend at once offers his blood. What was the blood group of the donor ?
(1) Blood group O (2) Blood group A
(3) Blood group B (4) Blood group AB

28. A normal visioned man whose father was colour-blind marries a woman whose father was also colour blind. They have their first child as a daughter. What are the chances that this child would be colour-blind?
(1) 25% (2) 50%
(3) 100% (4) Zero percent

AIPMT (Mains) 2012

29. A test cross is carried out to :-
(1) assess the number of alleles of a gene.
(2) determine whether two species or varieties will breed successfully.
(3) determine the genotype of a plant at F_2
(4) predict whether two traits are linked.

30. Represented below is the inheritance pattern of a certain type of traits in humans. Which one of the following conditions could be an example of this pattern?



(1) Haemophilia
(2) Thalassemia
(3) Phenylketonuria
(4) Sickle cell anaemia

NEET-UG 2013

31. If two persons with 'AB' blood group marry and have sufficiently large number of children, these children could be classified as 'A' blood group : 'AB' blood group 'B' blood group in 1 : 2 : 1 ratio. Modern technique of protein electrophoresis reveals presence of both 'A' and 'B' type proteins in 'AB' blood group individuals. This is an example of :-
(1) Complete dominance
(2) Codominance
(3) Incomplete dominance
(4) Partial dominance

32. Which Mendelism idea is depicted by a cross in which the F_1 generation resembles both the parents?
(1) co-dominance
(2) incomplete dominance
(3) law of dominance
(4) inheritance of one gene

33. Which of the following statements is not true of two genes that show 50% recombination frequency ?
(1) If the genes are present on the same chromosome, they undergo more than one crossovers in every meiosis
(2) The genes may be on different chromosomes
(3) The genes are tightly linked
(4) The genes show independent assortment

34. The **incorrect** statement with regard to Haemophilia is :-
(1) A single protein involved in the clotting of blood is affected
(2) It is a sex-linked disease
(3) It is a recessive disease
(4) It is a dominant disease

35. If both parents are carriers for thalassemia, which is an autosomal recessive disorder, what are the chances of pregnancy resulting in an affected child?
(1) 100% (2) No chance
(3) 50% (4) 25%

TG: @Chalnaayaaar

AIPMT 2014

36. Fruit colour in squash is an example of :-
(1) Recessive epistasis
(2) Dominant epistasis
(3) Complementary genes
(4) Inhibitory genes

37. A man whose father was colour blind marries a woman who had a colour blind mother and normal father. What percentage of male children of this couple will be colour blind ?
(1) 25% (2) 0% (3) 50% (4) 75%

38. In a population of 1000 individuals 360 belong to genotype AA, 480 to Aa and the remaining 160 to aa. Based on this data, the frequency of allele A in the population is :-
(1) 0.4 (2) 0.5 (3) 0.6 (4) 0.7

39. A human female with Turner's syndrome :-
(1) has 45 chromosomes with XO.
(2) has one additional X chromosome.
(3) exhibits male characters.
(4) is able to produce children with normal husband.

AIPMT 2015

40. A man with blood group 'A' marries a woman with blood group 'B'. What are all the possible blood groups of their offsprings ?
(1) A,B and AB only (2) A,B,AB and O
(3) O only (4) A and B only

41. How many pairs of contrasting characters in pea plants were studied by Mendel in his experiments?
(1) Six (2) Eight
(3) Seven (4) Five

42. Multiple alleles are present :-
(1) At different loci on the same chromosome
(2) At the same locus of the chromosome
(3) On non-sister chromatids
(4) On different chromosomes

43. Alleles are :-
(1) true breeding homozygotes
(2) different molecular forms of a gene
(3) heterozygotes
(4) different phenotype

TG: @Chalnaayaaar

44. A population will not exist in Hardy - Weinberg equilibrium if :-
(1) There are no mutations
(2) There is no migration
(3) The population is large
(4) Individuals mate selectively

45. Which is the most common mechanism of genetic variation in the population of sexually reproducing organism?
(1) Chromosomal aberrations
(2) Genetic drift
(3) Recombination
(4) Transduction

RE-AIPMT 2015

46. A colour blind man marries a woman with normal sight who has no history of colour blindness in her family. What is the probability of their grandson (son's son) being colour blind ?
(1) 0.25 (2) 0.5
(3) 1 (4) Nil

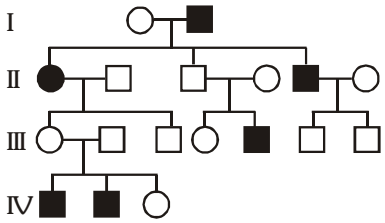
47. The term "linkage" was coined by :-
(1) W. Sutton (2) T.H. Morgan
(3) T. Boveri (4) G. Mendel

48. A pleiotropic gene :-
(1) controls multiple traits in an individual
(2) is expressed only in primitive plants
(3) is a gene evolved during Pliocene
(4) controls a trait only in combination with another gene

49. In his classic experiments on pea plants, Mendel did not use :-
(1) Flower position
(2) Seed colour
(3) Pod length
(4) Seed shape

50. A gene showing codominance has :-
(1) both alleles independently expressed in the heterozygote
(2) one allele dominant on the other
(3) alleles tightly linked on the same chromosome
(4) alleles that are recessive to each other

51. In the following human pedigree, the filled symbols represent the affected individuals. Identify the type of given pedigree :-



(1) X-linked dominant
(2) Autosomal dominant
(3) X-linked recessive
(4) Autosomal recessive

NEET-I 2016

52. Which of the following most appropriately describes haemophilia ?
(1) Recessive gene disorder
(2) X - linked recessive gene disorder
(3) Chromosomal disorder
(4) Dominant gene disorder

53. A tall true breeding garden pea plant is crossed with a dwarf true breeding garden pea plant. When the F_1 plants were selfed the resulting genotypes were in the ratio of :-
(1) 1 : 2 : 1 :: Tall homozygous : Tall heterozygous : Dwarf
(2) 1 : 2 : 1 :: Tall heterozygous : Tall homozygous : Dwarf
(3) 3 : 1 :: Tall : Dwarf
(4) 3 : 1 :: Dwarf : Tall

54. Match the terms in Column-I with their description in Column-II and choose the correct option :-

Column-I		Column-II	
(a)	Dominance	(i)	Many genes govern a single character
(b)	Codominance	(ii)	In a heterozygous organism only one allele expresses itself
(c)	Pleiotropy	(iii)	In a heterozygous organism both alleles express themselves fully
(d)	Polygenic inheritance	(iv)	A single gene influences many characters

(1) (a)–(ii), (b)–(i), (c)–(iv), (d)–(iii)
(2) (a)–(ii), (b)–(iii), (c)–(iv), (d)–(i)
(3) (a)–(iv), (b)–(i), (c)–(ii), (d)–(iii)
(4) (a)–(iv), (b)–(iii), (c)–(i), (d)–(ii)

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55. Pick out the correct statements :-
(a) Haemophilia is a sex-linked recessive disease
(b) Down's syndrome is due to aneuploidy
(c) Phenylketonuria is an autosomal recessive gene disorder.
(d) Sickle cell anaemia is a X-linked recessive gene disorder
(1) (a) and (d) are correct
(2) (b) and (d) are correct
(3) (a), (c) and (d) are correct
(4) (a), (b) and (c) are correct

56. In a testcross involving F_1 dihybrid flies, more parental-type offspring were produced than the recombinant-type offspring. This indicates:
(1) The two genes are located on two different chromosomes.
(2) Chromosomes failed to separate during meiosis.
(3) The two genes are linked and present on the same chromosome.
(4) Both of the characters are controlled by more than one gene.

NEET-II 2016

57. A true breeding plant is :-
(1) near homozygous and produces offspring of its own kind
(2) always homozygous recessive in its genetic constitution
(3) one that is able to breed on its own
(4) produced due to cross-pollination among unrelated plants

58. If a colour-blind man marries a woman who is homozygous for normal colour vision, the probability of their son being colour-blind is:-
(1) 0.75 (2) 1
(3) 0 (4) 0.5

59. Genetic drift operates in :-
(1) Non-reproductive population
(2) Slow reproductive population
(3) Small isolated population
(4) Large isolated population

TG: @Chalnaayaaar

60. In Hardy-Weinberg equation, the frequency of heterozygous individual is represented by:-
(1) pq (2) q^2 (3) p^2 (4) 2pq

NEET (UG) 2017

61. Thalassemia and sickle cell anemia are caused due to a problem in globin molecule synthesis. Select the correct statement :-
(1) Both are due to a quantitative defect in globin chain synthesis
(2) Thalassemia is due to less synthesis of globin molecules
(3) Sickel cell anemia is due to a quantitative problem of globin molecules
(4) Both are due to a qualitative defect in globin chain synthesis

62. The genotypes of a husband and Wife are I^AI^B & $I^A i$. Among the blood types of their children, how many different genotypes and phenotypes are possible?
(1) 3 genotypes ; 4 phenotypes
(2) 4 genotypes ; 3 phenotypes
(3) 4 genotypes ; 4 phenotypes
(4) 3 genotypes ; 3 phenotypes

63. Which one from those given below is the period for Mendel's hybridization experiments ?
(1) 1840 - 1850 (2) 1857 - 1869
(3) 1870 - 1877 (4) 1856 – 1863

64. A disease caused by an autosomal primary non-disjunction is :
(1) Klinefelter's Syndrome
(2) Turner's Syndrome
(3) Sickel Cell Anemia
(4) Down's Syndrome

NEET(UG) 2018

65. Select the ***correct*** statement :-
(1) Franklin Stahl coined the term "linkage".
(2) Punnett square was developed by a British scientist.
(3) Spliceosomes take part in translation.
(4) Transduction was discovered by S. Altman.

TG: @Chalnaayaaar

66. Which of the following pairs in ***wrongly*** matched ?
(1) Starch synthesis in pea : Multiple alleles
(2) ABO blood grouping : Co-dominance
(3) XO type sex determination : Grasshopper
(4) T.H. Morgan : Linkage

67. Which of the following characteristics represent 'Inheritance of blood groups' in humans ?
a. Dominance
b. Co-dominance
c. Multiple allele
d. Incomplete dominance
e. Polygenic inheritance
(1) b, c and e (2) a, b and c
(3) b, d and e (4) a, c and e

68. A woman has an X-linked condition on one of her X chromosomes. This chromosome can be inherited by :-
(1) Only daughters
(2) Only sons
(3) Only grandchildren
(4) Both sons & daughters

NEET(UG) 2019

69. What map unit (Centimorgan) is adopted in the construction of genetic maps?
(1) A unit of distance between two expressed genes, representing 10% cross over
(2) A unit of distance between two expressed genes, representing 100% cross over
(3) A unit of distance between genes on chromosomes, representing 1% cross over
(4) A unit of distance between genes on chromosomes, representing 50% cross over

70. A gene locus has two alleles A, a. If the frequency of dominant allele A is 0.4 then what will be the frequency of homozygous dominant, heterozygous and homozygous recessive individuals in the population ?
(1) 0.36 (AA); 0.48(Aa); 0.16 (aa)
(2) 0.16 (AA); 0.24 (Aa); 0.36 (aa)
(3) 0.16 (AA); 0.48 (Aa); 0.36 (aa)
(4) 0.16 (AA); 0.36 (Aa); 0.48 (aa)

TG: @Chalnaayaaar

71. The frequency of recombination between gene pairs on the same chromosome as a measure of the distance between genes was explained by :-
(1) T.H. Morgan (2) Gregor J. Mendel
(3) Alfred Sturtevant (4) Sutton Boveri

72. In *Antirrhinum* (Snapdragon), a red flower was crossed with a white flower and in F_1 generation, pink flowers were obtained. When pink flowers were selfed, the F_2 generation showed white, red and pink flowers. Choose the incorrect statement from the following :-
(1) This experiment does not follow the Principle of Dominance
(2) Pink colour in F_1 is due to incomplete dominance.
(3) Ratio of F_2 is $\frac{1}{4}$ (Red) : $\frac{2}{4}$ (Pink) : $\frac{1}{4}$ (White)
(4) Law of Segregation does not apply in this experiment.

73. Select the **incorrect** statement.
(1) Male fruit fly is heterogametic.
(2) In male grasshoppers, 50% of sperms have no sex-chromosome.
(3) In domesticated fowls sex of progeny depends on the type of sperm rather than egg.
(4) Human males have one of their sex-chromosome much shorter than the other.

NEET (UG) 2019 (Odisha)

74. Match the items of column I with column II

Column-I	Column-II
(a) XX-XO method of sex determination	(i) Turner's syndrome
(b) XX-XY method of sex determination	(ii) Female heterogametic
(c) Karyotype-45	(iii) Grasshopper
(d) ZW-ZZ method of sex determination	(iv) Female homogametic

Select the correct option from the following :-
(1) a-ii, b-iv, c-i, d-iii
(2) a-i, b-iv, c-ii, d-iii
(3) a-iii, b-iv, c-i, d-ii
(4) a-iv, b-ii, c-i, d-iii

75. In a marriage between male with blood group A and female with blood group B, the progeny had either blood group AB or B. What could be the possible genotype of parents ?
(1) I^Ai (Male) : I^BI^B(Female)
(2) I^AI^A (Male) : I^BI^B(Female)
(3) I^AI^A(Male) : I^Bi (Female)
(4) I^Ai (Male) : I^Bi (Female)

76. The production of gametes by the parents, the formation of zygotes, the F_1 and F_2 plants, can be understood using :-
(1) Pie diagram
(2) A pyramid diagram
(3) Punnet square
(4) Venn diagram

77. In which genetic condition, each cell in the affected person has three sex chromosomes XXY ?
(1) Thalassemia
(2) Kleinfelter's Syndrome
(3) Phenylketonuria
(4) Turner's Syndrome

NEET (UG) 2020

78. Experimental verification of the chromosomal theory of inheritance was done by-
(1) Morgan (2) Mendel
(3) Sutton (4) Boveri

79. Select the **correct** match :-
(1) Thalassemia - X linked
(2) Haemophilia - Y linked
(3) Phenylketonuria - Autosomal dominant trait
(4) Sickle cell anaemia - Autosomal recessive trait, chromosome-11

80. Identify the wrong statement with reference to the gene 'I' that controls ABO blood groups:
(1) Allele 'i' does not produce any sugar.
(2) The gene (I) has three alleles.
(3) A person will have only two of the three alleles.
(4) When I^A and I^B are present together, they express same type of sugar.

81. How many true breeding pea plant varieties did Mendel select as pairs, which were similar except in one character with contrasting traits?
(1) 8 (2) 4 (3) 2 (4) 14

82. Select the **correct** match.
(1) Thalassemia - X linked
(2) Haemophilia - Y linked
(3) Phenylketonuria - Autosomal dominant trait
(4) Sickle cell anaemia - Autosomal recessive trait, chromosome - 11

NEET (UG) 2020 (COVID-19)

83. The number of contrasting characters studied by Mendel for his experiments was :-
(1) 14 (2) 4 (3) 2 (4) 7

84. The best example for pleiotropy is :-
(1) Skin colour
(2) Phenylketonuria
(3) Colour Blindness
(4) ABO Blood group

85. Chromosomal theory of inheritance was proposed by :-
(1) Sutton and Boveri
(2) Bateson and Punnet
(3) T. H. Morgan
(4) Watson and Crick

NEET(UG) 2021

86. The production of gametes by the parents, formation of zygotes, the F_1 and F_2 plants, can be understood from a diagram called :-
(1) Bullet square
(2) Punch square
(3) Punnett square
(4) Net square

87. In a cross between a male and female, both heterozygous for sickle cell anaemia gene, what percentage of the progeny will be diseased ?
(1) 50% (2) 75%
(3) 25% (4) 100%

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NEET-UG - 2022

88. Given below are two statements:

Statement I: Mendel studied seven pairs of contrasting traits in pea plants and proposed the Laws of Inheritance

Statement II: Seven characters examined by Mendel in his experiment on pea plants were seed shape and colour, flower colour, pod shape and colour, flower position and stem height

In the light of the above statements, choose the **correct** answer from the options given below :-

(1) Both **Statement I** and **Statement II** are incorrect

(2) **Statement I** is correct but **Statement II** is incorrect

(3) **Statement I** is incorrect but **Statement II** is correct

(4) Both **Statement I** and **Statement II** are correct

89. XO type of sex determination can be found in:-

(1) Birds

(2) Grasshoppers

(3) Monkeys

(4) *Drosophila*

90. Given below are two statements: one is labelled as **Assertion (A)** and the other is labelled as **Reason (R)**.

Assertion (A): Mendel's law of Independent assortment does not hold good for the genes that are located closely on the same chromosome.

Reason (R): Closely located genes assort independently.

In the light of the above statements, choose the **correct answer** from the options given below:

(1) Both **(A)** and **(R)** are correct but **(R)** is not the correct explanation of **(A)**

(2) **(A)** is correct but **(R)** is not correct

(3) **(A)** is not correct but **(R)** is correct

(4) Both **(A)** and **(R)** are correct and **(R)** is the correct explanation of **(A)**

91. Which of the following occurs due to the presence of autosome linked dominant trait ?

(1) Myotonic dystrophy

(2) Haemophilia

(3) Thalassemia

(4) Sickle cell anaemia

92. The recombination frequency between the genes a & c is 5%, b & c is 15%, b & d is 9%, a & b is 20%, c & d is 24% and a & d is 29%. What will be the sequence of these genes on a linear chromosome ?

(1) d, b, a, c (2) a, b, c, d

(3) a, c, b, d (4) a, d, b, c

93. If a colour blind female marries a man whose mother was also colour blind, what are the chances of her progeny having colour blindness ?

(1) 50% (2) 75%

(3) 100% (4) 25%

Re-NEET-UG - 2022

94. Given below are two statements :-

Statement I : Sickle cell anaemia and Haemophilia are autosomal dominant traits.

Statement II :

Sickle cell anaemia and Haemophilia are disorders of the blood.

In the light of the above statements, choose the **correct answer** from the options given below :

(1) Both **Statement I** and **Statement II** are correct

(2) Both **Statement I** and **Statement II** are incorrect

(3) **Statement I** is correct but **Statement II** is incorrect

(4) **Statement I** is incorrect but **Statement II** is correct

95. The chromosomal theory of inheritance was proposed by :-

(1) Thomas Morgan

(2) Sutton and Boveri

(3) Gregor Mendel

(4) Robert Brown

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96. If a female individual is with small round head, furrowed tongue, partially open mouth and broad palm with characteristic palm crease. Also the physical, psychomotor and mental development is retarded. The karyotype analysis of such an individual will show :-

(1) 47 chromosomes with XXY sex chromosomes

(2) 45 chromosomes with XO sex chromosomes

(3) 47 chromosomes with XYY sex chromosomes

(4) Trisomy of chromosome 21

97. What is the expected percentage of F_2 progeny with yellow and inflated pod in dihybrid cross experiment involving pea plants with green coloured, inflated pod and yellow coloured constricted pod ?

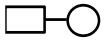
(1) 100% (2) 56.25%

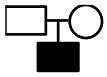
(3) 18.75 % (4) 9%

98. Select the **incorrect** match regarding the symbols used in Pedigree analysis :-

(1) — Sex unspecified

(2) — Affected individual

(3)  — Consanguineous mating

(4)  — Parent with male child affected with disease

99. A normal girl, whose mother is haemophilic marries a male with no ancestral history of haemophilia. What will be the possible phenotypes of the offsprings ?

(a) Haemophilic son and haemophilic daughter.

(b) Haemophilic son and carrier daughter.

(c) Normal daughter and normal son.

(d) Normal son and haemophilic daughter.

Choose **the most appropriate answer** from the options given below :

(1) (a) and (b) only (2) (b) and (c) only

(3) (a) and (d) only (4) (b) and (d) only

EXERCISE-II (Previous Year Questions) ANSWER KEY

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer	4	4	3	4	3	4	2	1	1	3	4	3	4	1	1
Question	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Answer	3	3	1	1	2	3	1	2	4	2	2	1	4	3	1
Question	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Answer	2	1	3	4	4	2	3	3	1	2	3	2	2	4	3
Question	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Answer	4	2	1	3	1	4	2	1	2	4	3	1	3	3	4
Question	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
Answer	2	2	4	4	2	1	2	4	3	3	3	4	3	3	1
Question	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
Answer	3	2	1	4	4	4	4	4	2	1	3	3	4	2	2
Question	91	92	93	94	95	96	97	98	99						
Answer	1	3	3	4	2	4	3	3	2						

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Exercise - III Master Your Understanding

EXERCISE-III (A) NCERT BASED QUESTIONS

1. Variations are :-
(1) Degree by which progeny differs from their parents
(2) Degree by which progeny similar to their parents
(3) Process by which characters are passed on from parent to progeny
(4) True breeding lines

2. Mendel found that the F_1 always resembled either one of the parents and that the trait of the other parent was not seen in them. This is due to :-
(1) Segregation
(2) Dominance
(3) Partial dominance
(4) Unit factor

3. In monohybrid cross the allele do not show any blending and that both the characters are recovered as such in F_2 generation. This statement is explained on the basis of :-
(1) Dominance
(2) Segregation
(3) Independent assortment
(4) All the above

4. In monohybrid cross proportion of 3 : 1 explains :-
(1) Dominance (2) Segregation
(3) Both (1) and (2) (4) Unit factor

5. Theoretically, the modified allele could be responsible for the production of :-
(1) less efficient enzyme
(2) A non functional enzyme
(3) Non enzyme at all
(4) All the above

6. The modified allele is equivalent to the unmodified allele when it produces :-
(1) Normal enzyme
(2) A non functional enzyme
(3) No enzyme at all
(4) Inactive enzyme

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7. Recessive traits are seen due to :-
(1) Formation of non functional enzyme
(2) Enzyme is not produced
(3) 1 and 2 both
(4) Formation of functional enzyme

8. A diploid organism is heterozygous for 4 loci, how many types of gametes can be produced?
(1) 8 (2) 16
(3) 2 (4) 32

9. When a cross is made between tall plant with yellow seed (TtYy) and tall plant with green seed (Ttyy), what proportion of phenotype in the offspring could be expected to be tall and green :-
(1) 25% (2) 12.5%
(3) 37.5% (4) 50%

10. Which of the following was/were applied first time to problems in biology during Mendel's investigations into inheritance?
(1) Statistical analysis
(2) Mathematical logic
(3) Computational devices
(4) Both 1 and 2

11. A true breeding line is that :-
(1) Having undergone continuous cross pollination
(2) Having undergone continuous self pollination
(3) Having undergone continuous vegetative propagation
(4) Obtain through tissue culture (Meristem)

12. How many true breeding pea plant varieties were selected by Mendel?
(1) 7 (2) 14 (3) 21 (4) 28

13. Regarding to pair of dominant and recessive trait which of the following combination is wrong?
(1) Flower colour – Violet / white
(2) Flower position – Axial / terminal
(3) Pod shape – Inflated / constricted
(4) Seed colour – Green / yellow

14. Segregation of alleles is a random process so what would be the chances of a gamete containing either alleles?
(1) 25 % (2) 50 % (3)75 % (4) 100 %

15. Graphical representation to calculate the probability of all possible genotypes of offspring in a genetic cross, is known as :-
(1) Mendel square
(2) Punnett square
(3) Crossboard method
(4) Emasculation method

16. If F_1 individual of genotype (Tt) go through sexual reproduction, then it's gamete (pollen grain) with genotype (T) have what chances to pollinate eggs of the genotype (T) ?
(1) 25 % (2) 50 % (3) 75 % (4) 100 %

17. Mendel proposed how many conclusions to consolidate his understanding of inheritance in monohybrid cross?
(1) One
(2) Two
(3) Three
(4) None of the rules, he proposed laws / principles

18. The law of dominance is used to explain the expression of only one of the parental characters in a monohybrid cross in ..... and the expression of both in..... .
(1) F_1 and F_2 (2) F_2 and F_3
(3) F_1 and F_3 (4) F_2 and F_1

19. The fact that the alleles do not show any blending and that both the characters are recovered as such in F_2 generation, become the basis of :-
(1) Law of Dominance
(2) Law of paired factors
(3) Law of segregation
(4) Law of independent assortment

20. In the theoretical explanation of allelic interaction for dominant and recessive forms, the recessive trait is seen due to production of-
(1) Normal enzyme
(2) A non-functional enzyme
(3) No enzyme production
(4) Either 2 or 3

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21. Dominance of any character generally depends on :-
(1) Gene or product related informations of any gene
(2) Character choosen by ourself in study
(3) Environmental factors
(4) Both 1 and 2

22. In any dihybrid cross segregation of one pair of characters is independent of other pair of characters, is known as :-
(1) Law of segregation
(2) Law of purity of gametes
(3) Law of independent assortment
(4) Law of dominance

23. In dihybrid mendelian cross how many types of genotype and phenotype will be obtain :-
(1) 4 and 9 respectively
(2) 9 and 4 respectively
(3) 9 & 16 respectively
(4) 4 & 16 respectively

24. Mendel published his work in 1865 but it remained unrecognised till 1900. Which of the following reason was not responsible for it
(1) Communication was not easy?
(2) His concept of genes (factors) as stable and discrete unit was not accepted by his contemporaries as an explanation for apparently continuous variations
(3) Use of mathematics to explain biological phenomenon
(4) Use of emasculation technique

25. It was found that sometimes the F_1 - had a phenotype that did not resemble either of the two parents and was in between the two. This is the case of :-
(1) Dominance
(2) Incomplete dominance
(3) Codominance
(4) Pleiotropism

26. Multiple alleles can be found only when :-
(1) Population studies are made
(2) Individual study is made
(3) Mutation is absent
(4) Dominance is present

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27. In case of codominance :-
(1) F_1 - generation resembles both parents
(2) F_1 - generation is in between both parents
(3) F_1- generation resembles either of the two parents
(4) All of the above

28. Incomplete dominance can be seen in :-
(1) Flower colour in *Mirabilis jalapa*
(2) Flower colour in *Pisum sativum*
(3) Size of starch grains in pea
(4) 1 and 3 both

29. Genes responsible for ABO blood group determines which of the following biomolecules of RBC plasma membrane?
(1) Phospholipid (2) Proteins
(3) Sugars (4) Cholesterole

30. If there are four allelic forms for the gene controlling ABO blood group then what will be the number of possible genotypes?
(1) 6 (2) 10 (3) 12 (4) 14

31. Multiple alleles can be found during study of:-
(1) Gametes (2) Individual
(3) Population (4) All above

32. Shape of seed depends on starch granules size, so inheritance of seed shape show ..... relationship while inheritance of starch grains show ..... .
(1) Dominant recessive, codominance
(2) Incomplete dominance, codominance
(3) Dominant - recessive, incomplete dominance
(4) Codominance, incomplete dominance

33. Inheritance of starch grains size shows :-
(1) Dominant recessive relationship
(2) Codominance
(3) Incomplete dominance
(4) Multiple allelism

34. In sickle cell anaemia which of the following genotype will show disease phenotype :-
(1) Hb^A Hb^A (2) Hb^S Hb^S
(3) Hb^S Hb^A (4) Both (1) and (2)

35. Which of the following is not concerned with sickle cell anaemia :-
(1) Sixth position of β-chain
(2) α–chain of Hb
(3) Valine
(4) Haemoglobin

36. Polymerisation of mutant haemoglobin molecule in sickle cell anaemia is due to :-
(1) Sulphadrugs
(2) High oxygen
(3) Low oxygen concentration
(4) Plasmodium falciparum

37. Which of the following is correct ?
(1) When genes are grouped on the same chromosome, some genes are very tightly linked and showed very low recombination
(2) When genes are loosely linked show very low recombination
(3) When genes are tightly linked show higher recombination
(4) When genes are loosely linked show no recombination

38. In Morgan's experiment, what will be percentage of recombination in case of body colour and eye colour in *Drosophila* ?
(1) 37.2% (2) 1.3%
(3) 98.7% (4) 37.2%

39. In a large number of insects the mechanism of sex determination is of :-
(1) XO type (2) XY type
(3) ZW type (4) All the above

40. Male heterogamety found in :-
(1) Human (2) Grasshopper
(3) Many birds (4) 1 and 2 both

41. Which of the following characters of *Drosophila* is not suitable for genetical studies ?
(a) They could be grown on simple synthetic medium in laboratory
(b) They complete their life cycle in about 2-weeks
(c) Single mating produces few number of progeny flies.
(d) They have many types of hereditary variations that can be seen with low power microscope.
(e) Male & Female flies are not easily distinguishable
(1) a, b, c (2) a, b, c, d, e
(3) d and e (4) c and e

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42. Parallelism between chromosome and behaviour of gene was established by :-
(1) de Vries, Correns and Tschermak
(2) Sutton and Boveri
(3) Bateson and Punnet
(4) Landsteiner and de Castello

43. Who among the following united the knowledge of chromosomal segregation with Mendelian principles and called it chromosomal theory of inheritance?
(1) Bateson (2) Boveri
(3) Sutton (4) Correns

44. Experimental verification of chromosomal theory of inheritance was proposed by :-
(1) Tschermak (2) de Vries
(3) Sutton (4) Morgan

45. Drosophila melanogaster is best material for study of inheritance. Which of the following reason is not appropriate for selection *of Drosophila ?*
(1) They can grow on simple synthetic medium
(2) They complete their life cycle in about two weeks
(3) Single mating could produce small number of progeny
(4) Clear differentiation of the sexes

46. Who among the following used the frequency of recombination between gene pairs on the same chromosome as a measure of distance between genes and mapped their position?
(1) Davenport (2) Sturtevant
(3) Morgan (4) Nillson

47. If yellow body, white eyed Drosophila is crossed with wild brown body red eyes Drosophila. Then what would be frequency of recombinants in F_1 generation?
(1) 100 % (2) 1.3 %
(3) 98.7 % (4) 0 %

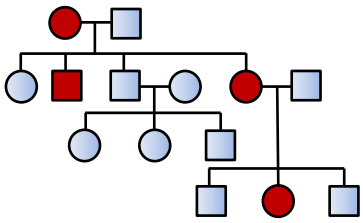
48. Which of the following structure was discovered by Henking ?
(1) y-body (2) Bar body
(3) x-body (4) Nu-body

49. In some insect's half of the sperms possess X chromosome along with autosomes while half of the sperms carries :-
(1) Only autosomes
(2) y chromosome along with autosome
(3) x chromosome only
(4) x chromosome along with autosomes

50. Female heterogamety can be seen in :-
(1) Human beings (2) Drosophila
(3) Hen (4) Honey bees

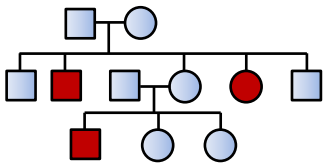
51. Which symbol of pedigree is correctly matched?
(1) – Female
(2) – affected offspring
(3) – Affected male of autosomal recessive disease
(4) – Marriage between relatives

52. Given pedigree represents inheritance of myotonic dystrophy which is an autosomal dominant disorder. What will be genotype of parents ?



(1) Mother - aa Father - AA
(2) Mother - AA Father - aa
(3) Mother - Aa Father - aa
(4) Mother - aa Father – aa

53. Given pedigree chart shows inheritance of autosomal recessive trait (for e.g. - sickle cell anaemia) then what will be genotype of parent ?



(1) Father - (Aa) Mother - (aa)
(2) Father - (aa) Mother - (aa)
(3) Father - (Aa) Mother - (Aa)
(4) Father - (AA) Mother - (AA)

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54. Mendelian disorder are mainly determined by:
(1) Alternation or mutation in single gene
(2) Absence of one chromosome
(3) Excess of one of more chromosome
(4) All the above

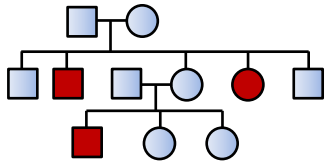
55. Study of family history about inheritance of a particular trait in several generations of a family called :-
(1) Phylogeny (2) Ontogeny
(3) Pedigree analysis (4) Cladistics

56. Symbols ⑤ used in pedigree analysis, represents :-
(1) Five offspring with unspecified sex
(2) Five diseased offspring
(3) Five unaffected offspring
(4) Five affected offsprings

57. Genetic disorders determined by alteration or mutation in single gene are known as :-
(1) Chromosomal disorders
(2) Mendelian disorders
(3) Non inheritable disorders
(4) All above

58. Which of the following is not a Mendelian disorder ?
(1) Haemophilia
(2) Cystic fibrosis
(3) Cry-hyphen chat syndrome
(4) Sickle cell anaemia

59.



In this given pedigree what is the mode of inheritance?
(1) Autosomal dominant
(2) Autosomal recessive
(3) X-linked dominant
(4) X-linked recessive

60. Chromosomal disorders arise due to :-
(1) Absence of one or more chromosomes
(2) Excess of one or more chromosomes
(3) Abnormal arrangement of one or more chromosomes
(4) All the above

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EXERCISE-III (B) ANALYTICAL QUESTIONS

61. On crossing red & white flowered plants the ratio of red and white flowered plants in F_2-generation was 60:20, then on selfing the heterozygous red flowered plants, the offsprings would be :-
(1) 72:24 (2) 40:60
(3) 52:48 (4) 84:16

62. What is the probability of homozygous plants for both dominant characters in F_2 generation of a dihybrid cross ?
(1) 1/16 (2) 3/16
(3) 4/16 (4) 9/16

63. An offspring of two homozygous parents differing from one another by alleles at only one gene locus is known as :-
(1) Back cross (2) Monohybrid
(3) Dihybrid (4) Trihybrid

64. Cross AABb X aaBb yields AaBB : AaBb : Aabb : aabb offspring in the ratio of :-
(1) 0:3:1:1 (2) 1:2:1:0
(3) 1:1:1:1 (4) 1:2:1:1

65. Mrs. verma has a autosomal gene pair 'Bb' and she contain x-linked gene 'd' both on of her x-chromosome. What is the percentage of gamete which contain 'bd' genes ?
(1) 1/2 or 50% (2) 1/4 or 25%
(3) 3/4 or 75% (4) 1 or 100%

66. A dihybrid plant on self pollination, produced 400 seeds with 9 types of genotype. How many seeds will have genotype TtRr ?
(1) 200 (2) 100
(3) 50 (4) 150

67. If two pea plants having red (dominant) coloured flowers with unknown genotypes are crossed, 75% of the flowers are red and 25% are white. The genotypic constitution of the parents having red coloured flowers will be:
(1) Both homozygous
(2) One homozygous and other heterozygous
(3) Both heterozygous
(4) Both hemizygous

68. In a dihybrid cross where two parents differ in two pairs of contrasting traits like seed colour yellow (YY) and seed colour green (yy) with seed shape round (RR) and seed shape wrinkled (rr). The number of green coloured seeds (yy) among sixteen products of F_2 generation will be :-
(1) 2 (2) 4 (3) 6 (4) 8

69. Select the incorrect statement for Gregor Mendel :-
(1) He conducted hybridization experiments on garden pea for seven years.
(2) He applied statistical analysis and mathematical logic for the first time to the problems in biology.
(3) His experiments had a small sampling size.
(4) He conducted artificial cross-polination experiments using several true-breeding pea lines.

70. "When two pairs of traits are combined in a hybrid, segregation of one pair of characters is independent of the other pair of characters". This explains :-
(1) Law of dominance
(2) Law of segregation
(3) Law of independent assortment
(4) Postulate of paired factors

71. Which of the following is not observed in a monohybrid cross?
(1) Recessive parental trait is expressed without any blending in the F_2-generation
(2) Recessive parental trait is expressed without any blending in the F_1-generation
(3) Dominance also explains the proportion of 3 : 1 obtained at the F_2
(4) Genotype ratio is 1 : 2 : 1

72. When AABBcc is crossed with AaBbCc then the ratio of hybrid for all the three genes is:-
(1) 1/8 (2) 1/4
(3) 1/16 (4) 1/32

73. In a plant, red fruit (R) is dominant over yellow fruit (r) and tallness (T) is dominant over shortness (t). If a plant with RRTt genotype is crossed with a plant that is rrtt:-
(1) All the offsprings will be tall with red fruit
(2) 25% will be tall with red fruit
(3) 50% will be tall with red fruit
(4) 75% will be tall with red fruit

74. Out of three characters on chromosome no. 4, two characters indicate linkage and not mentioned by Mendel. These characters were:-
(1) Pod shape – stem length
(2) Pod shape – seed colour
(3) Pod shape – pod colour
(4) Pod colour – stem length

75. The Punnett square shown below represents the pattern of inheritance in dihybrid cross when yellow (Y) is dominant over white (y) and round (R) is dominant over wrinkled (r) seeds.

♀/♂	YR	Yr	yR	yr
YR	F	J	N	R
Yr	G	K	O	S
yR	H	L	P	T
yr	I	M	Q	U

A plant of type 'H' will produce seeds with the genotype identical to seeds produced by the plants of :–
(1) Type M (2) Type J
(3) Type P (4) Type N

76. In a plant gene 'A' is responsible for tallness and its recessive allele 'a' for dwarfness and 'B' is responsible for red flower colour and it's recessive allele 'b' for white flower colour. A tall and red flowered plant with genotype AaBb crossed with dwarf and red flowered (aaBb). What is the percentage of dwarf-white flowered offspring of above cross :-
(1) 50% (2) 6.25%
(3) 12.5% (4) 50%

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77. Which of the following points is of Mendelism?
(1) law of independent assortment which was based on monohybrid cross
(2) law of independent assortment which could be stated on the basis of segregation of gametes
(3) incomplete dominance gave a new way to mendelism
(4) a character is controlled by a pair of unit factors

78. If Aabb × aaBb, then genotypic ratio of its progeny will be :-
(1) 9 : 3 : 3 : 1 (2) 1 : 2 : 1
(3) 1 : 1 : 1 : 1 (4) 4 : 1

79. Red and tall dominant character hybrid plant when crossed with recessive white dwarf plant (RrTt x rrtt). What will be the ratio of respective four combinations red tall, red dwarf, white tall and white dwarf plants in the next generation :-
(1) 9 : 3 : 3 : 1 (2) 15 : 1 : 0 : 0
(3) 9 : 3 : 4 : 0 (4) 4 : 4 : 4 : 4

80. A plant with genotype AABbCcDD is self pollinated. Provided that the four genes are independently assorting, what proportion of the progeny will show the genotype AAbbccDD ?
(1) $\frac{1}{4}$ (2) $\frac{1}{16}$
(3) $\frac{1}{64}$ (4) $\frac{1}{256}$

81. A person with unknown blood group under ABO system, has suffered much blood loss in an accident and needs immediate blood transfusion. His one friend who has a valid certificate of his own blood type, offers for blood donation without delay. What would have been the type of blood group of the donor friend ?
(1) Type B (2) Type AB
(3) Type O (4) Type A

82. In a family, father has a blood group 'A' and mother has a blood group 'B'. Their children show 50% probability for a blood group 'AB' indicating that :-
(1) Father is heterozygous
(2) Mother is heterozygous
(3) Either of parent is heterozygous
(4) Mother is homozygous

83. In man, gene producing the disease phenyl ketonuria also produces a number of abnormal phenotypic traits, which are collectively syndrome. This gene results mental retardation, widely spaced incisors, pigmented patches on the skin and excessive sweating such types of genes are called :-
(1) Polygene
(2) Pleiotropic gene
(3) Lethal gene
(4) Supplementary gene

84. Which one of the following conditions though harmful in itself, is also a potential saviour from a mosquito borne infectious disease :-
(1) Thalassaemia
(2) Sickle cell anaemia
(3) Pernicious anaemia
(4) Leukaemia

85. Which of the four couples, claiming the baby with O+ blood type are possibly the biological parents of it?
(1) AB^- and A^+ (2) A^+ and O^-
(3) O^+ and AB^+ (4) B^- and O^-

86. In a plant flower colour is the example of quantitative trait and controlled by one gene pair. How many plants show parental phenotype in F_2 generation:–
(1) $\frac{2}{16}$ (2) $\frac{2}{4}$ (3) $\frac{2}{64}$ (4) $\frac{2}{256}$

87. The weight of fruit in a plant is determined by the number of dominant alleles of a certain number of genes. If seven weight categories are noticed, how many gene sites would be involved?
(1) two (2) three
(3) four (4) five

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88. A scientist performed the gene mapping experiments in maize. He mapped the genes on chromosomes on the basis of % crossing over between different genes. One map unit corresponds to one % crossing over or recombination. The genes showing more than 50% recombination were not supposed to be linked on same chromosome. In crossing over studies on maize, scientist observed the following % crossing over between genes A, B, C, D –between. A and D 10%, between A and C 3%, between genes C and D 7%, between genes A and B 5%, and between genes C and B 8%. On the basis of above observation find out the correct sequence of genes A, B, C and D on chromosomes:-

(1) BCDA (2) ABCD
(3) BACD (4) DACB

89. A test cross of F_1 flies +a/+b produced the following offspring

++/ab = 9 ab/ab = 9
+b/ab = 41 a+/ab = 41

What will be distance between linked gene?

(1) 82 cM
(2) 18 cM (cis)
(3) 20 cM
(4) 18 cM (trans)

90. A man and woman are both affected by vitamin D resistance rickets, which is a dominant sex-linked allele. All of the female offsprings of this couple are affected with rickets but some of the male offsprings are not. What are the genotypes of the parents?

(1) Both are homozygous for the trait.
(2) The woman has two dominant alleles and man has one dominant allele.
(3) Both parents have only recessive alleles.
(4) Each parent has only one dominant allele.

91. Depending upon the distance between any two genes which is inversely proportional to the strength of linkage, cross overs will vary from :-

(1) 50-100% (2) 0-50%
(3) 75-100% (4) 100-150%

92. What shall be the ratio of heterozygous normal, homozygous colour blind and colourblind hemizygous in offsprings of a colour blind husband & a carrier wife :-

(1) 1:1:2 (2) 1:1:1
(3) 2:1:1 (4) 1:2:1

93. A and B genes are completely linked. What shall be genotype of progeny in a cross between AB/ab and ab/ab :-

(1) AAbb and aabb
(2) AaBb and aabb
(3) AABB and aabb
(4) None

94. Mendelian dihybrid and dihybrid with linkage are respectively related with how many chromosomes :-

(1) 1 pair & 2 pair
(2) 2 pair & 1 pair
(3) 2 pair & 2 pair
(4) 1 pair & 1 pair

95. In *Drosophila* the XXY condition leads to femaleness whereas in human beings the same condition leads to Klienfelter's syndrome in male. It proves :-

(1) In human beings Y chromosome is active in sex determination
(2) Y chromosome is active in sex determination in both human beings and *Drosophila*
(3) In *Drosophila* Y - chromosome decides femaleness
(4) Y chromosome of man has genes for syndrome

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96. Based on observation on monohybrid crosses Mendel draw some conclusion. Which of the following is not correct :-

(1) Characters are controlled by discrete units called factors

(2) Factors occur in pairs

(3) In a similar pair of factors one member of the pair dominates the other

(4) The postulate of dominance also explains the proportion of 3 : 1 obtained at the F_2

97. Which is incorrect ?

(i) ABO blood groups are controlled by the gene-I

(ii) Gene I has four alleles

(iii) I^A and I^B produce same type of sugar

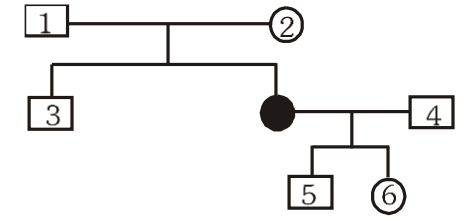
(iv) i or I° produce different type of sugar

(v) I^A and I^B are incomplete dominant

(1) i, ii (2) v, ii

(3) ii, iii, iv (4) ii, iii, iv, v

98. The pedigree shows the occurence of albinism which is a recessive trait. If person 4 is homozygous, the carrier for the trait is:-



○ → female □ → male ● → albinism

(1) 1, 4, 5 and 6 (2) 5 and 6

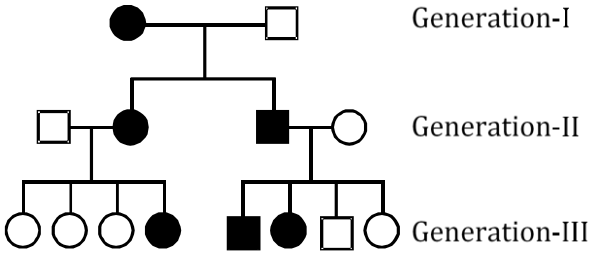
(3) 1, 2 and 3 (4) 1, 2, 5 and 6

99. A human male is heterozygous for autosomal gene A, B and G. He is also hemizygous for haemophilic gene h. What proportion of his sperm will be abgh:-

(1) $\frac{1}{4}$ (2) $\frac{1}{8}$

(3) $\frac{1}{16}$ (4) $\frac{1}{32}$

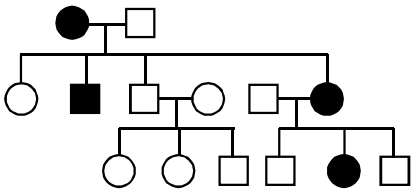
100. A pedigree is shown below for a disease that is autosomal dominant. The genetic make up of the first generation is :-



(1) AA, Aa (2) Aa, aa

(3) Aa, AA (4) Aa, Aa

101. Given below is the pedigree of an autosomal dominant disorder-Myotonic dystrophy.



In this pedigree the genotype of all affected children will be :-

(1) AA (2) Aa

(3) AA or Aa (4) aa

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EXERCISE-III ANSWER KEY

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer	1	2	2	3	4	1	3	2	3	3	2	2	4	2	2
Question	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Answer	2	3	1	3	4	4	3	2	4	2	1	1	4	3	2
Question	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Answer	3	3	3	2	2	3	1	2	1	4	4	2	3	4	3
Question	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Answer	2	4	3	1	3	4	3	3	1	3	3	2	3	2	4
Question	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
Answer	1	1	2	2	1	2	3	2	3	3	1	1	3	1	4
Question	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
Answer	3	4	3	4	2	3	3	2	2	2	2	2	3	4	4
Question	91	92	93	94	95	96	97	98	99	100	101				
Answer	2	2	2	2	1	3	4	4	3	2	2				